

**TEACHING FOR CREATIVITY:
A STUDY IN REFLECTIVE PRACTICE.**

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

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ABSTRACT

This thesis relies on a professional lifetime of reflective practice which is ongoing. It proposes a pedagogy derived from the distillation of that experience. The data which is examined in detail comes from classroom processes recorded over a recent period of five years.

The thesis is about the role of creativity in learning and teaching. While it is true that creativity is often included as a desirable quality in a range of educational aims and methodologies, it is rarely emphasised, analysed or linked with learning and language across the curriculum.

Language, in the broad sense of symbolic systems, is a necessary medium or tool for conscious awareness, action and reflection, and therefore for creative learning and teaching. Neuroscience now shows how the linguistic processing necessary for creativity occurs in the brain.

The process of analysing classroom practice, student perceptions and teacher attributes is carried out using a qualitative research methodology.

A simple model and a template for planning and reflection are developed to facilitate reflective practice for educators. It is argued that, under specified conditions, this pedagogy can be used by other teachers; that it is transferable.

INTRODUCTION

The substance of this thesis is my practice as a teacher. From reflecting on my practice over thirty years of classroom teaching, I distilled a creative pedagogy which I wanted to better understand and see if it could be transferable. The experience and evidence-based development of creative pedagogy is the central theme of this thesis.

I state my theory and relevant published research and use evidence from my own practice as teacher, participant and participant observer to both critically evaluate the theory and, in conjunction with the theory, to develop and evaluate a methodology – a creative pedagogy - for implementing the theory.

I now realise I am part of a growing number of other educational professionals seeking to research our own practice critically and to learn from that rather than trying to fit our practice to a set of top down standards using the same assessment and with the same content. The history of the teacher research movement extends from the sixteenth century to today. Significant teacher-researchers have included Rousseau (1712-1778), Pestalozzi (1746-1827), Montessori (1870-1952), Dewey (1859-1952), and Stenhouse (1926-1982). Throughout this time two principles have remained: the close observation of students, and a teacher research community, whether a group of teachers from a school, region, country or overseas through the internet (Shangoury Hubbard & Miller Power 1999, p. 5). Kincheloe also argues that only by engaging in complex, critical research will teachers rediscover their professional status, empower their practice in the classroom and improve the quality of education for their pupils (Kincheloe 2003). A number of the methodologies employed by these teacher-researchers are considered in Chapter 4 “Qualitative methodology”.

The attempt to understand pedagogy by observing and participating in actual teaching and learning in schools provided rich and complex experiences but the question of how to systematise and analyse this practice was at first problematic. How do we begin to pin down, let alone record the bubbling cauldron of a class of thirty adolescents, their perceptions and concerns, the teacher’s inner and outer feelings, words and pedagogy?

After long searching and thinking about qualitative research I chose to do this by data collection, selection and analysis and reduction through notation and tabulation. The notation system which I schematised to analyse the lesson notes and lesson transcriptions derived from creativity and learning theories and research. Students' and adults' written observations and comments were used to identify creative teacher attributes. This was as far as I know an innovative method. To nail down the ephemeral was difficult but I thought academically necessary. It turned out to be exciting and revealing and added to the eventual creation of a creative pedagogy and a template for teacher use.

The notion of transferring a set of creative teacher attributes also became a central issue. I argue that pedagogy is developed through theory and practice combined with ongoing reflection. This sometimes occurs in schools where teachers learn from each other and in pre-service and in-service education. I have suggested some different ways that this may be done, again after reflecting on my own education and professional practice as a teacher and current work with student teachers. Transferability has already been demonstrated on a small scale and there are examples in this thesis which came about through personal contact with a teacher, through professional supervision of a student teacher and in the planning stage with a whole work shop of some thirty practising teachers. This bottom-up shared process of supportive critical preparation and evaluation has been noteworthy and also an experience similarly encountered by teachers associated with the "Teachers' Research Movement" reported in the American Educational Research Association's Journal (Cochran-Smith 1999).

The theory, practice and reflection model is also emulated in the design of the thesis. It is divided into three parts, Part I "Theory and Research Context", Part 2 "Research and Qualitative Evidence" and Part 3 "Application in Teaching and Learning". It begins with a theoretical understanding of creativity, learning and language and then moves to interpretation and analysis of the practice of a creative teacher. This is finally reflected on in terms of success, possible improvement and replicability and the construction of a template for creative pedagogy.

This thesis offers a perspective from an experienced teacher, in terms of time, place – the classroom as a teacher by choice – as well as experience for significant periods in

three countries. It also incorporates the words and products of secondary students themselves.

Part 1 Chapter 1 explores the notion of creativity itself, its definition, characteristics and processes. It does this by examining the literature on creativity, the views of experts and the views of creators themselves. Qualities essential to creativity are gleaned and noted.

Chapter 2 investigates theories on creativity and learning through the work of cognitive psychologists, neuroscientists and educators. Here too the main characteristics emerge and are recorded. These include the importance of experience, the brain's plasticity, neuronal connections, the role of images and the involvement of emotion. Views on the teacher's role in creative learning, its importance and obstacles to its implementation are also discussed. It is noted that there is little reference by these theorists and researchers to the part that language plays from these sources.

Chapter 3 looks at the role of language in creativity and learning in general and in particular, including speech, speech and thought, speech and discussion, reading and the written word, narrative and cooperation. The various roles of language in creative learning are considered. In conclusion, the aspects of creativity, learning, neuroscience and language thus far discovered are seen to have some complementary characteristics that in combination might form a powerful template for educational practice and process.

Part 2 Chapter 4 deals particularly with a methodology that can test the hypothesis that creative teaching improves learning in the secondary class room and through reduction and analysis point to the quintessential qualities and attributes needed in a creative pedagogy. The research question is described in relation to research tradition and appropriate methodology. The data collection process is outlined and the elements of participant observer protocols, replicability and validity, significant in a teacher as researcher approach, are discussed. Reduction, display and verification of the data are outlined and the school and student contexts explained.

Chapter 5 introduces the creativity and learning codes, derived from the characteristics of creativity and learning established in Chapters 1 to 3, to be assigned to the lesson descriptors and transcripts. A series of lessons taken from across the curriculum is then described by the teacher in the role of participant/observer. Each one is notated with the codes denoting the characteristics of creativity and learning. They are interpreted and commented on in terms of their social and learning components.

Chapter 6 similarly analyses and notates transcriptions of recorded lessons. At the end of this chapter three tables and a graph are presented showing the results. The most notable are: that creative learning occurred across the curriculum, that the qualities of purpose, product and engagement were repeatedly present and as creativity characteristics identifiable in a lesson increased, so did the variety of learning characteristics.

Chapter 7 considers surveys, questionnaires and observations by adults and students. It teases out and clusters themes occurring in the questionnaire responses and observations. These responses are also presented as a table and as a bar graph showing the list of teacher attributes which were frequently noted and observed in creative teaching.

Part 3 Chapter 8 considers and assesses existing pedagogies from a creativity perspective. It then lays out the elements of a creative pedagogy, derived from the findings in the thesis, as a holistic model. It also contains a template for teachers with actual examples of it in use.

Chapter 9 concludes by recalling the initial hypothesis, evaluating the findings, and suggesting future directions in terms of transferability of teacher attributes, inservice and pre-service education, systemic implementation and further research.

Overall, creativity in learning is viewed positively by most educators. Indeed, there are many pedagogies which incorporate elements of creativity. However, at the current time there exists no specific or holistic creative pedagogy.

Neuroscience over the last decade has indicated that the learning brain is transformative and creative. It has also emphasised the important roles of symbol and image, language and thought in the cognitive process.

It is therefore not only timely but vital that we shape pedagogy which both emulates and enhances the brain's natural learning process: a creative pedagogy. In this thesis I have offered a contribution to such pedagogy, one which is useable by teachers, and able to be practised and evidenced in the classroom. I look forward to collaboration with my teacher-researcher colleagues to further this challenging, exciting and promising endeavour.

PART 1 THEORY AND RESEARCH CONTEXT

CHAPTER 1

CREATIVITY

This chapter seeks to define “creativity”. The creativity literature provides a range of definitions and these will be canvassed. The views of creators from a variety of fields will also be considered. My own definition is that the creative act is a transformative one. It makes something new or original with a purpose.

1.1 “Creativity” an introductory synopsis.

Definitions of “creativity” are, overall, cumulative rather than contested. There is agreement on the central elements of originality and utility but to these are added a variety of emphases, characteristics and processes. All have transformation at their centre.

Robert J. Sternberg has gathered together a wide and significant range of research in creativity by behavioural scientists. His “Handbook of Creativity” is a comprehensive, definitive and authoritative single-volume review of the literature. The volume is divided into six parts, each part deals with a different aspect of creativity, and its investigation and the contributions are written by individual scientists (Sternberg 1999, p. ix). In terms of defining “creativity” many of these authors will be referred to although not these authors exclusively. The first of these is Mayer, who conducted detailed research on the variety of definitions used in the field and came to the view that there is considerable agreement on the definition. This agreement centres on the ideas of originality and useful product, but there are other diverse issues which arise through research and study (Mayer 1999, p. 450).

Mayer tabulates the frequency of the words “new”, “novel” and “original”; “utility”, “value”, “significant”, “adaptive”, “appropriate” and “valuable” in the work of seven authors in creativity research and finds that there appears to be consensus that the two

defining characteristics of creativity are indeed originality and usefulness. However, he points out:

... there is a lack of consensus on such basic clarifying issues as whether “creativity” refers to a product, process or person; whether creativity is personal or social; whether creativity is common or rare; whether creativity is domain-general or domain-specific; and whether creativity is quantitative or qualitative (Mayer 1999, p. 451).

The last two alternatives may need clarification. “Domain-general” and “domain-specific” distinguish between general and particular creative ability, described by Mayer as follows:

According to the domain-general view, creativity is a general skill or trait or characteristic that can be applied to a wide variation of situations. In contrast, the domain-specific view of creativity is that different kinds of creativity are required in different domains, for example, the creativity involved in artistic production is different from that involved in scientific discovery (Mayer 1999, p. 451).

A “qualitative” view of creativity infers that it exists in some people and not others while a “quantitative” view of creativity is that it exists to varying degrees in all individuals. The former view leads to current educational interest in “the gifted and talented”, those few and particular students who are creative, and to questions about why some people are more creative than others (Martindale 1995). The difference between “quantitative” and “qualitative” creativity is nicely summarised by Cropley who says:

In the qualitative sense creativity is something that a person has or does not have. This approach restricts research on creativity to studying the chosen few ... By contrast the quantitative position ... is that there is a continuum of greater or lesser levels of creativity ... and assumes that everybody can display creativity, even if to different degrees (Cropley 2001, p. 12).

The definitions which follow demonstrate the commonly held, central definition as well as a variety of different emphases, issues, characteristics and descriptions of processes signaled in Mayer’s observation. They are taken from creativity experts and creators

themselves; they come from a range of disciplines including philosophy, neuroscience, mathematics, politics, literature, music, design and physics; they relate to science and arts as well as creativity on large and small scales.

1.2 Definitions, characteristics and processes.

1.2.1 Inspiration and imitation.

Philosophers of ancient Greece were concerned with creativity. Plato's "Ion", a discussion between Socrates and Ion, written in 380 B.C.E., emphasised society's need for creative people and urged the state to foster their development (Cropley 2001, p. 4). Their notion of creativity contains a strong spiritual dimension:

The gift which you possess of speaking excellently about Homer is not an art, but, as I was just saying, an inspiration; there is a divinity moving you, like that contained in the stone which Euripides calls a magnet, but which is commonly known as the stone of Heraclea. This stone not only attracts iron rings, but also imparts to them a similar power of attracting other rings; and sometimes you may see a number of pieces of iron and rings suspended from one another so as to form quite a long chain: and all of them derive their power of suspension from the original stone. In like manner the Muse first of all inspires men herself; and from these inspired persons a chain of other persons is suspended, who take the inspiration (Plato n.d., p. 5).

The stone of Heraclea and the magnetic attraction of rings is a vivid metaphor for the conductive power of creativity as its influence moves from person to person. An inspired person, or inspired group of people, tends to inspire others. Similarly, Sternberg and Lubart (1999, p. 5) note that in the earliest accounts of creativity, the creative person was seen as an empty vessel which was filled with inspiration by a divine being. The individual would then pour out the inspired ideas, forming an otherworldly product and affecting others.

This characteristic of being inspired, literally breathed into, by a source believed to be outside the human being continued until the twentieth century in references by writers, poets and artists to their "muse" or "daemon". Jeffrey (1992, p. 379) comments that

William Blake contended that some of his own poetry was the result of ‘immediate dictation’ he being no more than the ‘secretary’ of the work, the ‘authors being in eternity’.

“Muses” and “daemons” appear in the works of Dante (1265-1321), Chaucer (c.1343-1400), Shakespeare (c. 1564-1616), Milton (1608-1674) and the Romantic poets in the second half of the 18th century. In the latter, it has been suggested that the power of nature and some of its manifestations replace the “muse”. Jeffrey (1992, p. 379) suggests that a new element is Wordsworth’s attempt to “naturalise” the concept of inspiration while retaining its links with older conventions and gives the example of his use of the phrase ‘Nature’s self which is the breath of God’.

One of the forces of nature used in this way by the Romantic poets is the “wind”. Wordsworth’s “The Prelude” opens with the line ‘O there is blessing in this gentle breeze’ and its ‘correspondent’ breeze of inspiration ‘felt within’ follows (Wordsworth circa 1894, p. 362). In Shelley’s “Ode to the West Wind” the wind represents the external inspiration and the classical notion of the poet as a “prophet” in the words:

Be thou spirit fierce
My spirit! Be thou me impetuous one!

Drive my dead thoughts over the universe
Like withered leaves to quicken a new birth!
And, by the incantation of this verse,

Scatter, as from an unextinguished hearth
Ashes and sparks, my words among mankind!
Be through my lips to unawakened earth

The trumpet of a prophecy! (Shelley 1907, p. 573).

Other inspiring images from nature include flowers, Wordsworth’s daffodils, and birds, Shelley’s skylark:

Hail to thee, blithe spirit!
Bird thou never wert,
That from heaven or near it,
Pourest thy full heart
In profuse strains of unpremeditated art (Shelley 1907, p. 596).

Otherworldly inspiration often appears from a dream in the Romantic poets. Coleridge's "Kubla Khan" (1816) is a well known example, and with the dream comes mention too of intuition. These both retain the concept of ideas seeming to come from elsewhere, not sought deliberately, and may link to the period of mental incubation which often occurs before the idea is fully formed and which will be discussed later.

Another frequent characteristic of creativity discussed by classical Greek philosophers is that of "imitation" or "mimicry". Plato's view has been described this way:

Plato had two theories of art. One may be found in his dialogue "The Republic", and seems to be the theory that Plato himself believed. According to this theory, since art imitates physical things, which in turn imitate the "forms", art is always a copy of a copy, and leads us even further from truth and toward illusion. For this reason, as well as because of its power to stir the emotions, art is dangerous. Plato's other theory is hinted at in his shorter dialogue "Ion", and in his exquisitely crafted "Symposium". According to this theory the artist, perhaps by divine inspiration, makes a better copy of the "true" than may be found in ordinary experience. Thus the artist is a kind of prophet (Rowan 2009, p. 1).

This is an interesting issue in the present time when "replication" can be exact, with fast electronic copies and sophisticated photography. Until the twentieth century, art was judged largely on its similitude to the original but is also and more often now regarded in respect of what it expresses. While mimicry in classical times sought to achieve perfection, by the sixteenth century there were creative works which transformed the original. It is common knowledge that Shakespeare's plots were not his own but the plays he created from them are original in expression and artistry. In the twentieth century, Joe Cocker's rendering of John Lennon and Paul McCartney's song "With a little help from my friends" (1969) would not be regarded by many people as mimicry or imitation but rather a novel version of the song with a different sound and impact.

Baz Luhrmann's "Moulin Rouge" (2001) is a transformational pot-pourri of once original music, songs and styles.

The notion of imitation also seems to play an important part in the development of artists of all kinds as they copy, model or perform established pieces, learning their trade, before creating themselves something "original". Imitation, then, is relevant to creativity in a variety of ways: historically, culturally and in terms of process.

1.2.2 The art of thought.

A definition much relied on and frequently used in the creativity literature is that of Graham Wallas in his book "The Art of Thought" (Wallas 1926). He described four stages of creativity: preparation, incubation, illumination and verification or execution. These stages remain useful parameters in studies of creativity.

Preparation is immersion in the problem, which may take many years. It also involves thinking laterally, that is, combining disparate elements and transforming them in many ways and across many knowledge boundaries discussed and referred to later in this chapter.

Incubation is when the problem is purposely put aside to allow the ideas, associations, connections and possibilities free play beneath consciousness to generate new and interesting relationships.

Both stages can vary in time from a relatively short period to a "life's work" such as Darwin's forty years spent on "The Origin of the Species by Natural Selection" (1859).

The third stage, illumination, comes suddenly and with clarity. It is the time when a holistic and satisfying resolution or product is finally seen.

The fourth stage, verification or execution, is fixing it, whether recording it through a variety of media or constructing abstract or real models.

The second and third stages, incubation followed by illumination, are frequently reported and can be exemplified as follows. Leo Szilard saw his solution when he was alone at a traffic light. As it changed from red to green he realised that atomic chain reaction could unleash nuclear power, Bronowski (1973, p. 369). Henri Poincaré was alighting from a tourist bus when he realised that the transformations he had used to define Fuchsian functions were identical to those of non-Euclidian geometry, Andreasen (2005, pp. 44, 45). For both men this came after some time of intense thought and incubation. A later study of this sudden illumination from a cognitive perspective was made by Martindale (1995).

Finally, seeing a holistic and satisfying resolution or product is again often exemplified. Mozart is said to have heard the full musical score in his head and was only then able to commit it to paper, Andreasen (2005, p. 40). Einstein worked with visualised and sensed internal images, whirling and shifting about, forming patterns and making no mathematical sense at first. Only after he was satisfied that his mental constructs felt right, did he sit down to find appropriate mathematical expressions for the whole, Damasio (2006, p.107). Coleridge's "Kubla Khan" was famously dreamed and written on waking, Andreasen (2005, p. 21). I have written many plays in my life and quite often they come to me in their entirety after periods of intermittent thought, often on awaking from sleep.

Recently, interest has been shown in the fact that statistically more people suffering from dyslexia are creative and this too may relate to their need to see the whole picture, to see holistically, because of their difficulty in handling the individual components of words (Stein 2001, pp. 12-36).

It could be argued that Wallas could have better labeled the first stage as intention and preparation or that he needed to include reflection during and at the end of the process or that transformation of elements and novel combination should have been included.

However, while these stages may be differently expressed or expressed in more detail, they represent the common pattern of focus, withdrawal and then breakthrough and make the key point that creativity is a process, not an event. Furthermore, they can be related to science and the arts and to human creativity at all ages.

1.2.3 Creativity research in the twentieth century.

After 1926 when Wallas's work was published there was a lull in commentary and research until interest began to grow in the 1950s and a few research institutes concerned with creativity were founded. However, several indicators of the volume of work on creativity show that it remained a relatively marginal topic in psychology at least until recently (Sternberg & Lubart 1999, p. 3).

Sternberg (1996), Cropley (1967 to 2007) and Runco (1999) have written extensively on creativity during this time. All of them track milestones in creativity research over the last fifty years. These include the seminal works of Guilford (1950), Getzels and Jackson (1962), Wallach and Kogan (1965), and many more. The significant issues in these findings in creativity research are definitions, experimentation and measurement. The researchers also discuss a variety of brain activities associated with creativity including intuition and incubation, divergent and convergent thinking, analogising, problem solving, bisociative function, metacognition, intrinsic and extrinsic motivation and synthesis, analysis and practicality. They are also specifically concerned with creativity in learning from different perspectives which is referred to in Chapter 2 (p. 26).

In relation to definitions and allied characteristics their views make significant contributions. Guilford first proposed the concept of "divergent thinking" in the 1950s, when he noticed that creative people tended to exhibit this type of thinking more than others. He associated divergent thinking with creativity, giving it several characteristics:

1. **fluency** (the ability to produce great number of ideas or problem solutions in a short period of time).
2. **flexibility** (the ability to simultaneously propose a variety of approaches to a specific problem).
3. **originality** (the ability to produce new, original ideas).
4. **elaboration** (the ability to systematise and organise the details of an idea in a head and carry it out) (Guilford 1950, pp. 444-454).

Guilford believed that standard intelligence tests do not favour divergent thinking, working better for convergent thinkers. This view and research started the debate about intelligence and creativity: were they interlocked or separated?

Getzels and Jackson's work in 1962 concluded that creativity was not clearly distinct from intelligence. The examples showed that overall there was more playfulness, risk taking and confidence in the highly creative as opposed to the high scoring IQ students who tended to respond as they had been taught to, using labels and appropriate communication. Two examples are:

In response to the picture stimulus perceived most often as a man sitting in an airplane reclining his seat on his return from a business trip or professional conference, one high IQ student gave this response:

Mr. Smith is on his way home from a successful business trip. He is very happy and he is thinking about his wonderful family and how glad he will be to see him again. He can picture it about an hour from now; his plane landing at the airport and Mrs. Smith and their three children all there welcoming him again (Getzels & Jackson 1962, p. 39).

One high creativity student gave this response to the same picture:

This man is flying back from Reno where he has just won a divorce from his wife. He couldn't stand to live with her anymore, he told the judge, because she wore so much cold cream on her face at night that her head would slide across the pillow and hit him on the head. He is now contemplating skid-proof face cream (Getzels & Jackson 1962, p. 39).

And

When asked to draw a picture entitled 'Playing Tag in the School Yard', one high creativity student returned the blank sheet of paper with the title changed to 'Playing Tag in the School Yard – During a Blizzard' (Getzels & Jackson 1962, p. 43).

The differences seem more to do with convergent and divergent thinking than IQ scores and later research has shown that although very many creative people are also highly intelligent, it appears that a sizeable proportion is not (Cropley 1967; Torrance 1962; Nickerson 1999, p. 396).

Attempts were made to replicate Getzels' and Jackson's work by Torrance (1963) with similar outcomes and Wallach and Kogan (1965) with different results. Sternberg's conclusion was:

At the very least, creativity seems to involve synthetic, analytical and practical aspects of intelligence: synthetic to come up with ideas, analytical to evaluate the quality of those ideas and practical to formulate a way of effectively communicating those ideas and of persuading people of their value. But beyond the basics, it is difficult to find substantial agreement among those working in the field (Sternberg & O'Hara 1999, p. 269).

In short, the relationship between creativity and intelligence remains controversial. However, many of the research findings have identified other characteristics which have proven to be significant. One could argue that convergent/divergent thinking and research into creativity that used picture stimulus might at least have contributed to the practice and respect for open ended questions and problem solving in education. The characteristic of humour in the responses is also salient in creativity. Not only was it evident in the response, it was a quality greatly valued by the high creativity students themselves, 'Sense of humour stood out as a high ranking ideal quality for the high-creativity group over the high IQ group The high-creativity students ranked sense of humour third out of thirteen qualities ... whereas the high IQ students ranked it ninth' (Steinberg & O'Hara 1999, p. 266).

Another characteristic was that of problem finding as well as problem solving; that creative insights often occur when a problem is discovered or defined rather than just when solutions are formed (Chand & Runco 1992; Mumford et al. 1994; Moore 1994; cited in Runco & Sacamoto 1999, p. 84).

The idea of a bisociative function was contributed by Arthur Koestler in "The Act of Creation" 1964. He listed three types of creative individual - the artist, the sage and the jester. Koestler's idea, put simply, is that the creative act is a "bisociation" (not mere association) which happens if two (or more) apparently incompatible frames of thought, 'matrices', are brought together by a creative mind in art, science and humour. This idea of opposites and apparent contradictions galvanising creativity arises later in the views of other commentators. Koestler also claims that humans are most creative when

rational thought is abandoned during dreams and trances and that all people have the capacity for creative activity which is frequently suppressed by the automatic routines of thought and behaviour that dominate their lives. These last two views tally with the idea of the subconscious, incubation and dreams and the notion of “quantitative” creativity already described

Arthur J Cropley, on the other hand, states that there is a common core to all discussions, especially when educational and psychological considerations are emphasised. This core has three elements:

1. **novelty** (a creative product, course of action or idea necessarily departs from the familiar).
2. **effectiveness** (it works, in the sense that it achieves some end – that may be aesthetic, artistic or spiritual, but may also be material such as winning or making a profit).
3. **ethicality** (the term ‘creative’ is not usually used to describe selfish or destructive behaviour, crimes, warmongering and the like) (Cropley 2001, pp. 5-6).

While the first two elements reflect the consensus view, the third departs from it. It can be argued that some highly complex creative acts have been present in both crime and war. “The great train robbery” was a creative crime and “creative accounting” can be innovative but also illegal. The dam busters’ bouncing bomb, used in the Second World War, was clearly inventive, novel and effective. However, its destructive impact is viewed favourably or unfavourably depending whose side you are on; an example of partisan morality. Objectively though, it may be described as creative. Other war activities come into the same category, countless deceptions where clothing, currency and weapons were created by soldiers in prison camps are judged again through a moral perspective. Having said this, it is certainly true that the adjective “creative” is ameliorative rather than pejorative semantically as Cropley argues.

Cropley also makes the point of creativity’s changed scope over time:

Although creativity was initially looked at as an artistic/aesthetic phenomenon, in more recent times researchers have broadened the approach by looking more closely at creativity in mathematics and the natural sciences (Helson 1983; Roe 1952) as well as in the professions such as architecture or engineering (Facaoaru 1985; MacKinnon 1983) (Cropley 2001, p. 5).

The extensive work of Mark Runco during this same period revisits some of the concepts already discussed. These include the phenomenon of “insight” which he calls the “a-ha” moment adding that this may seem spontaneous but is often protracted; developed over time (Gruber 1981; Wallace 1991 cited in Runco 2007, p. 25). This observation tallies with Wallas’ views of incubation and illumination. Runco goes on to discuss intuition too with an additional emphasis on this “gut feeling” having a strong role in the sciences (Runco 2007, p. 28).

He adds to Koestler’s emphasis on the indication of opposites at play in creativity but refers to the difficulty with such dialectical thought for the young brain. He also discusses, on the contrary, associations and analogies common in most forms of thought but particularly in creative thinking referring to Mednick’s ‘associative theory of the creative process’ (Mednick 1962 cited in Runco 2007, p. 11).

A new idea which is raised by Runco and supported by Nickerson is that of knowledge acquisition: that many creative acts rely on some thousands of hours to master the prerequisite information. He quotes Thomas Edison’s phrase ‘genius is 10% inspiration and 90% perspiration’ (1932). He also makes the point that the person is in their “element” when doing this; totally engaged so that time is hardly noticed. A more recent comment in relation to music has the same characteristics. Charlie Watts, drummer with “The Rolling Stones”, referring to thirty years of highly successful musical composition and performance, says, ‘twenty five years sitting around; five years playing’ (Watts 2009).

As previously stated, psychologist Raymond Nickerson also both builds on some of the points already made and adds some new ones. The idea of many hours spent in getting to know your “domain” and being in your element is extended by Nickerson to the importance of extensive practice in your field, ‘... people who do noteworthy creative work in any given domain are almost invariably very knowledgeable about the domain’ (Nickerson 1999, p. 409).

The word “element” to describe the passion, sheer joy and long time commitment to an endeavour has gained currency in Ken Robinson’s latest work “The Element”

(Robinson 2009). He stresses the importance of guiding, wherever possible, children and young people in particular, into careers that match and extend their personal passion and talent in which they can find fulfillment and excel. Interestingly, he comments that this book took eight months to write but draws on thirty five years of life experience and thought. As a creation it too had a long incubation before it was executed and is a subject that he feels “passionate” about.

The relevance to creativity of “domain-knowledge” in both the sciences and the arts is also noted. An example in the musical sphere could be that strenuous, and in many ways soulless, time spent by the Beatles hammering out mostly “covers” in a Hamburg dive (1960-1962), before creating their own songs of such great originality.

Nickerson offers one caveat, in terms of very high levels of “domain-specific” knowledge, that of becoming “blinded” to new possibilities by “correct” expertise (Nickerson 1999, pp. 409-410).

Another characteristic, one which really is self evident, is the presence of confidence and the ability to take risks in creative ventures. Nickerson refers to Freeman who discusses this in relation to fear, ‘Timidity is not conducive to creativity. Fear is seen as a major reason why children hesitate to express their ideas, especially perhaps unconventional ones’ (Freeman 1983, pp. 481-485).

Nickerson expands this point referring to fear of exposing one’s limitations and fear of ridicule which he rightly points out are powerful deterrents to creative thinking or at least to the public exposure of creative effort. He considers the importance of success; the fine line between self confidence and arrogance and the tendency for creative students to be more difficult to manage in authoritarian contexts given that they are often nonconformists (Nickerson 1999, p. 414).

A last point made by Nickerson which really takes us back to our original definition is:

Purpose is essential to creative expression – nobody carves a statue without intending to do so ... I suspect that few people will question the malleability of purposes and

intentions. How best to get students to intend to be creative- to take creative behaviour as a goal – is a legitimate question (Nickerson 1999, p. 408).

He does not consider that the product may create the intention.

1.2.4 Recent creativity research.

The focus of other experts in creativity research, in the years following 1999, falls generally into three categories. The first is the continued interpretation of previous research, such as the article by Simonton (2000) who reviews the progress psychologists have made in understanding creativity since Guilford's call for more research on creativity. He discusses the progress which has taken place on four fronts: the cognitive processes involved in the creative act, the distinctive characteristics of the creative person, the development and manifestation of creativity across the individual life span, and the social environments most strongly associated with creative activity.

Another example of examining previous research from a different standpoint is that of Carlsson, Wendt and Risberg's study (2000) into hemispheric asymmetry in the brain and creativity, referred to in the research of Gazzaniga (1992) and Torey (1999) and included in my Chapter 2 (p. 65). They investigated the relationship between creativity and hemispheric asymmetry, as measured by regional cerebral blood flow. Their conclusions were that the highly creative group had higher trait anxiety than the low creative group. On the intelligence tests the low creative group was superior both on logical-inductive ability and on perceptual speed, while the groups were equal on verbal and spatial tests. The results are discussed in terms of complementary functions of the hemispheres. The anxiety trait may fit in with the often referred to "risk taking" activity in creativity.

The second category relates creativity research to various aspects of teaching and learning. One example is Petrowski's paper (2000) which highlights findings from a variety of research approaches including psychometrics, cognitive psychology, historiometrics, biology, and contextual studies relevant to teaching and learning with special emphasis on ways to frame research as a creative endeavour.

Another publication with an educational approach but of a more specific kind is Baer's (2003) research into the impact of a particular curriculum on "creativity". The 'core knowledge sequence' provides a specific outline of content in a number of curriculum areas for schools from kindergarten to Year 8 in the United States. His findings suggest that this curriculum, with its detailed and precise requirements of content studied at each grade level, does not negatively affect students' creativity and may even have a positive impact on creative performance in some areas.

These findings differ markedly from both "The NACCCE Report" (1999) and "The Cambridge Primary Review" (2009), discussed in Chapter 2 (section 2.4.4) of this thesis, in relation to core curriculum design in the United Kingdom. The reason for this may be that the curriculum initiative researched by Baer has some significant differences from the "National Curriculum" and the concomitant "testing" in the United Kingdom.

The first difference is that adoption of the 'core knowledge sequence' in the United States is voluntary and made by the local school with half of the curriculum still locally determined. The "National Curriculum" on the other hand, is a government requirement. The difference between a flexible curriculum determined by the school community as opposed to a rigid, tested curriculum imposed from above can have marked effects on a school's culture and quality of teaching and learning.

In terms of creativity, the "core" students did a little better creatively than the "non-core" students suggesting that specific content taught in the curriculum does not necessarily depress students' creativity, as critics had warned. The author concludes, referring to research on convergent and divergent thinking, that there may be a correlation of the two (Baer 2003, p. 300) when being creative.

This duality of imagination and logic or originality blooming from what is already known, or even commonplace, is often discussed in creativity research and has credibility. Often, so-called "convergent" thinking provides the necessary infrastructure on which a creative construction can be built. As we have seen, in the reflections of creators presented here, a great deal of their necessary essential knowledge or skill,

much of which could be characterised as convergent, comes from thorough immersion in the appropriate domain and discourse.

Duality is a recurring theme in “creativity” research: for instance, the combining of disparate or contradictory elements, the idea of single and double-loop operations in the brain, the role of its two complementary hemispheres and the interplay of language and thought, which are discussed in Chapter 2 (section 2.2.4.3) of this thesis.

The other aspect of Baer’s research, which unfortunately is not known, is the manner in which the “content” was taught. The ‘core knowledge sequence’ could have been taught and learned in a way conducive to creativity but this cannot be factored into the argument in respect of this particular research. We are also unaware of the kinds of teaching in the other half of the curriculum which could have had an effect on the students’ creativity.

The third, by far the largest category of recent creativity research, pertains predominantly to innovation and creativity in industry and management whether in a work place, research centre, laboratory or institution. This research applies our knowledge of creativity and innovation to increased productivity and improved performance in science and industry.

Shalley, Gilson, Terry and Blum (2000) found that higher job satisfaction and lower intentions to leave were found for individuals whose work environments complemented the creative requirements of their jobs.

Andriopoulos and Lowe (2000) through a process of “perpetual challenging” refer to the ways in which creative organisations enhance their employees’ internal drive to perceive every project as a new creative challenge so that their individual contribution is maximised and an innovative solution can arise.

Gans and Stern (2009) research a situation where creative solutions are not only encouraged but rewarded by achieving a license. They analyse the relationship between incumbency and innovative activity in the context of a model of technological

competition in which successful entrants are able to license their innovation to (or be acquired by) an incumbent.

An example of creativity research applied to “management” is the paper by Kor and Mahoney (2000) which analyses Edith Tilton Penrose's (1959) “The Theory of the Growth of the Firm”, arguably one of the most influential books of the second half of the twentieth century in terms of combining economics and management. The authors seek an understanding of the process by which the book came about and the lessons to be learned concerning research creativity.

Rather than presenting anything new, the characteristics of creativity in this more recent research reinforce, in different situations and applications, many of the qualities discussed so far as well as continuing to contest and challenge various aspects. Baer in particular exemplifies ongoing research into the central issues of creativity, such as convergence and divergence, imagination and logic, but in a way which challenges assumptions in terms of application, for him, in the area of education.

The most significant tendency is the adoption of creative research and creative culture by the world of work. However, this is not a “first”. We should not forget that Edison in the early twentieth century was a most prolific inventor, successful businessman and manager who used a mixture of creativity and democracy and at the same time rigour and authority with his work force. His workers were afforded an excellent creative environment with all the components they needed to experiment, the opportunity to “play” with ideas and the motivation of useful end products. On the other hand, they were paid little, worked long hours and had a boss who watched them with an eagle eye (Dodgson 2010).

1.2.5 Neuroscientists and creativity.

Susan Greenfield, an eminent neuroscientist, is Professor of Pharmacology at the University of Oxford. One of her emphases, in addition to novel combination and purpose, is on the importance of “meaning” in any definition of creativity. She says:

The answer lies in this issue of “meaning”. It is not good enough to bring together disparate elements, be they words or images or notes but they should be ones that have not been brought together before, and their juxtaposition triggers in others a new “significance” or “meaning” i.e. it is a way of tapping the outside of the normal cycle of thought associations into a new way of seeing the world (Greenfield 2005, p. 6).

Nancy Andreasen, currently Chair of Psychiatry and Director of the Mental Health Clinical Research Centre at the University of Iowa, began her career as a professor of renaissance literature. In her book “The Creating Brain” she echoes the necessity for “originality” and “utility” in the creation but adds, ‘A final component of creativity is that it must lead to a product of some kind’ (Andreasen 2005, p. 17).

Offering a comparable description of creativity, Leon Trotsky, in “On Literature and Art”, describes the process similarly but sees the existing elements as being transformed into a new whole for a purpose, ‘Artistic creation is always a complicated turning inside out of old forms’ (Trotsky 1970, p. 11).

It is one thing to understand something and express it logically and quite another thing to assimilate it organically reconstructing the whole system to one’s feelings and to find a new kind of artistic expression for this new entity (Trotsky 1970, p. 66).

Antonio Damasio is head of the University of Southern California Brain and Creativity Institute (B.C.I.) His work is most relevant in considering aspects of creativity and learning, particularly his examination of what goes on in the brain and body involving emotion. However, his comments on creativity itself offer new insights to two of the features already mentioned. These are “purpose” and “disparate” or “contrasting” elements. He provides a compelling quotation from the mathematician Henri Poincaré:

To create consists precisely in not making useless combinations and in making those which are useful and which are only a small minority. Invention is discernment, choice.

They are those which reveal to us unsuspected kinship between other facts, long known, but wrongly believed to be strangers to one another (Damasio 2006, p. 188).

This bringing together of disparate elements is also nicely phrased by world famous Bauhaus designer and artist Paul Klee in his “Pedagogical sketch book” where he describes the duality in creativity as a fusing of science and art, ‘Exactitude winged by intuition’ (Klee 1968, p. 8).

The role of “intuition” is also taken up by Damasio. Quoting physicist and biologist Leo Szilard, he writes:

The creative scientist has much in common with the artist and the poet. Logical thinking and an analytical ability are necessary attributes to a scientist but they are far from sufficient for creative work. Those insights in science that have led to a breakthrough were not logically derived from preexisting knowledge. The creative processes on which the progress of science is based operate on the level of the subconscious. Jonas Salk has forcefully articulated the same insight and proposed that creativity rests on a ‘merging of intuition and reason’ (Damasio 2006, p. 189).

Einstein similarly marries science with imagination:

The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill.

To raise new questions, new possibilities, to regard old problems from a new angle, require creative imagination and mark real advances ... (Einstein 1938, p. 92).

More recently, the belief that these elements of science, imagination and intuition can together create solutions was expressed by Rachel Webster, Professor of Astrophysics at University of Melbourne and Chair of the National Committee on Astronomy, in her contribution to the recent “Festival of Ideas” in Adelaide on Thursday 9th July 2009. She described a scenario, relating to creative genius:

... an individual sees a conundrum, a problem, and they make a leap to the answer and the leap is based in very deep intuition and once they’ve got there, and they’re usually pretty persuasive and pretty strong that it is the right answer, then the ladder of logic is built to that idea – and maybe it takes off. (Webster 2009).

The ladder of logic is compatible with Wallas's period of "execution" and can, as we have noted in the case of Charles Darwin, take a long time and painstaking work.

1.2.6 National report on creativity.

The National Advisory Committee on Creative and Cultural Education's "All Our Futures: Creativity, Culture and Education" arguably remains a benchmark for thinking on the place and importance of creativity in education.

It was a report to the Secretary of State for Education and Employment and the Secretary of State for Culture, Media and Sport in the United Kingdom in May 1999. It provides a comprehensive consideration of creativity in learning and teaching from a wide variety of significant creators and educators for the highest level of government.

Their definition of creativity was at one with the shared definition of creative research, 'Imaginative activity fashioned so as to produce outcomes that are both original and of value' (NACCCE Report 1999, 28 p. 3).

Further characteristics of creative processes which are advanced are also in keeping with the research discussed so far. They include, thinking or behaving imaginatively, imaginative activity that is purposeful, achieving an objective, generating something original and an outcome of value in relation to the objective.

The report further comments:

Creative insights often occur when existing ideas are combined or reinterpreted in unexpected ways or when they are applied in areas with which they are not normally associated. Often this arises by making unusual connections, seeing analogies and relationships between ideas or objects that have not previously been related (NACCCE Report 1999, 28 p. 4).

Of science the NACCCE Report states:

Discovery in science is not always strictly logical. It often results from unexpected leaps of imagination: from sudden moments of illumination in which the scientist grasps

the answer to a problem and then sets out to verify it by calculation. This can be as true for children setting out as for experienced scientists (NACCCE Report 1999, 28 p. 8).

This mirrors the comments of Graham Wallas and Albert Einstein already quoted.

In terms of the bigger picture, the NACCCE Report says, 'Creativity is possible in all areas of human activity and not only in the arts. Creative insights and advances have driven forward human culture in the sciences, in technology, in philosophy, the arts and the humanities' (NACCCE Report 1999, 28 p. 8).

Creativity can certainly happen on large and small scales. Many of the examples here are of human beings and creations that changed the history of the world. Looking at our history so far, we can also see obvious epochs when there were outbursts of creativity which had far reaching ramifications. To name but a few: ancient Babylon, classical Greece, the Renaissance, Elizabethan England, the Enlightenment, 17th Century Germany, 19th Century England, and early 20th Century America. These times seem to have in common enough freedom in which to think and work non-traditionally and sufficient economic stability. They also appear to have created an enthusiasm, galvanising other creators and people to their cause.

However, as psychologist Lev Vygotsky said, 'Creativity exists not only where it creates great historical works but also everywhere human imagination combines changes and creates anything new' (Vygotsky 1998, p. 166).

Jacob Bronowski, author of "The Ascent of Man" paints the big picture, emphasising that "man" is a transformer not an adapter of his environment and that this has occurred through imagination, intellect, culture, cooperation and creativity:

His imagination, his reason, his emotional subtlety and toughness, made it possible for him not to accept the environment but to change it. And that series of inventions, by which man from age to age has remade his environment, is a different kind of evolution – not biological but cultural (Bronowski 1973, p. 19).

1.3 Creators' views

Many of these characteristics described by experts in creativity are often exemplified in artistic creation, historically and today.

One example is Freddy Mercury's recollection of using a painting of Marie Antoinette (an already made art form) to trigger a new art form within a song. He turned old into new; it was a transformation; what he created was original. He said he 'twisted' it to the music' (Mercury 2006).

Glass designer Anna Ehrner, in a completely different medium, says:

For me creativity takes place in the blowing room. This is where glass is conceived, here it is fashioned and comes alive ... for me the aim is to freeze a moment in time, to capture an expression and give it artistic form. Or, put simply, to transform hot into cold (Ehrner 2009).

The creative process is described in literature too as transformation. Richard Flanagan describing Charles Dickens writes:

As clatter, hovels, cries and stench filled his being, he would keep on walking, the filthy dross of the everyday stirring in his alchemist's head and transforming into the pure gold of his fancy (Flanagan 2008, p. 35).

Australian author Peter Carey in his novel "Bliss" uses a metaphor, appropriately, to express not just the process but also the skills, contexts and effect of stories:

When they sat around the fire at night he could tell a long story just for fun, in the same way Richard might play his old accordion and Dani her Jew's harp. He never thought of what he did as original. It wasn't either. He told Vance's old stories, but told them better because he now understood them. He retold the stories of Bog Onion Road. And when he told stories about the trees and the spirits of the forest he was only dramatizing things that people already knew, shaping them just as you pick up rocks scattered on the ground to make a cairn. He was merely sewing together the bright patchworks of lives, legends, myths, beliefs, hearsay into a splendid cloak that gave a richer glow to all their

lives. He knew when it was right to tell one story and not another. He knew how a story could give strength or hope. He knew stories, important stories, so sad he could hardly tell them for weeping (Carey 1981, p. 386).

A last explanation of the process from a creator contains not only the act of transformation but also the elements of “domain-specific” knowledge and practice, incubation, illumination and execution and, to go back to Plato, Blake, the Romantic poets and Kipling, the “Muse”, or otherworldliness, that seems to “dictate” or supply the idea. The explanation comes from Keith Richards of “The Rolling Stones”:

Where songs come from I’ve no idea. They just zoom through the room. I mean I’ve never sat down in my life and said I’m now going to write a song. They come to me. I just sit around and play guitar. I’ll sing Buddy Holly, stuff like Eddie Cochran, Otis Redding, and after about half an hour, it’s coming and the whole thing changes. I’ve got the song, it’s not anything to do with what I was playing before but there’s a certain warm up period; it’s like a transmitter or an antenna really, just put your hand up and you’re there and you see what’s around. I’ve never had a problem with creating. I don’t like the idea of... I just pick them up. They are there already as far as I’m concerned (Richards 2009).

1.4 Creativity findings summarised.

What characteristics can we derive then from these definitions and descriptions in creative research, by experts in the field of creativity and from creators themselves? In summary, the central concept that creativity makes something original or new for a purpose was shared.

The additional characteristics of the creator were wide ranging. They included intention, commitment, imagination, intuition, inspiration, purpose, emotion, humour, confidence and making meaning.

The creative developmental processes incorporated imitation, making associations and analogies, divergent thinking, problem finding and solving, risk taking, synthesis, analysis and practicality, specific domain-knowledge, cooperation, the combination of

disparate elements and their transformation; a process of preparation, incubation, illumination and execution and a product.

In general terms, creativity can occur on large and small scales across all areas of human activity. It needs sufficient freedom and economic means to flourish whether it be at the macro or micro level. Freedom and resources are as important in the classroom as they are in the world at large.

Against the background of this discussion, my own definition of creativity, that of making something original or new for a purpose in an act of transformation, has been both supported and enriched.

The support comes from the broad acceptance of that definition in the research findings. Starting with Mayer's conclusions on the frequency of the words used in creativity research, namely synonyms for "useful" and "original", followed by a consideration of substantive issues raised across a diverse field of research, those touchstones of uniqueness, value and product are unchallenged.

The enrichment derives from the breadth and depth of the process and characteristics revealed and listed above. In particular, it seems that despite the completion of Wallas's work relatively early, in 1926, it does contain the key elements of the creative process: preparation or immersion, incubation, illumination and execution or implementation. These have been further refined and measured by subsequent research. The only really challenging issue has been the notion of "qualitative" creativity, the view that creativity is present only in some individuals. My experience in education repeatedly shows, on the other hand, that almost all students have degrees of creativity and that it can usually be enhanced. This will be illustrated later in the thesis.

What are we to make of this in terms of teaching for creativity, the central question to be investigated in this thesis? Can the characteristics of "creativity" summarised from the literature above ever be part of teaching?

The summary is already rich in references to learning and pedagogy without any specific attempt to align it with educational practice. The references span a number of

educational issues. They start with the accepted definition of “creativity”, combining usefulness and product (p.6), which are both concepts embedded in learning and education.

Further educational references include the State’s need for creative people. These are made by both Plato (380 B.C.E.) (p. 8) and NACCCE (1999) (p. 25). The challenge of increasing the range and scope of creativity in individuals is also highlighted (p.7).

The role of imitation in the process of “creativity” (p.11); the encouragement of unusual ideas (p.10) and the promotion of thinking in associations and analogies (p.17) also lie within the overt context of learning. Other ways of thinking, convergent, divergent and holistic (pp. 13-14) are considered in relation not only to “creativity” but to intelligence, dyslexia (p.12) and cognitive processing (p.19) – matters central to education.

In terms of pedagogy there are references to the importance of problem finding and problem solving, to having the opportunity to synthesise, analyse and practically formulate (p.15) as well as produce (p.23). “Creativity” has also for some twenty years been applied to mathematics, the natural sciences, engineering and architecture (p.16) and more generally to knowledge acquisition and domain knowledge (p.17).

Would the presence of these and other “creativity” characteristics enhance learning? Could they manifest themselves in creative teaching and if so what kind of teaching would this entail?

The next chapter “Creativity and Learning” explores these questions theoretically through the creative learning literature, cognitive psychology and neuroscience.

PART 1

CHAPTER 2

CREATIVITY AND LEARNING

Does creativity play a part in learning? Could the characteristics of creativity gleaned thus far be present in learning? Can it be part of teaching? Does creative teaching enhance learning?

While definitions of “creativity” largely complement each other, creativity in learning is much more contested. My initial hypothesis was that just as creativity is transformative so is learning and, furthermore, the brain itself is a creative and transforming organ. If this is so, then creativity and learning should be highly compatible, to say the least.

To test this I will, firstly, consider the literature on creativity and learning; the different points of view, perspectives and debate.

I will secondly look at the relevant work of cognitive psychologists and neuroscientists; their views, disputation or agreement. Where appropriate I will link the findings of both in relation to my hypothesis.

Thirdly, and in light of the above, I will discuss the role of the teacher in promoting creativity in learning; its difficulties and possibilities.

2.1 Educational theories on creativity and learning.

2.1.1 Definitions.

We need first of all a general definition of “learning”. Learning may be broadly defined as a cognitive process affected by experience which enables an individual to know, understand, behave or be capable of doing something which they were previously unable to do.

There are transformative elements within the cognitive process where the learner is not only integrating incoming material with existing knowledge but actively generating the relations among ideas, building internal and external connections as well as making new ones (Mayer 2008, p. 413).

These allied elements of learning, transformation and the brain are also addressed in the work of Ward et al. (1999). They argue that the idea of creative cognition emphasises creative capacity as an essential property of normative human cognition and, though they are not always recognised as such, examples of the fundamental nature of human generativity abound:

Beyond the obvious examples of artistic, scientific and technological advancement that are usually listed as instances of creativity, there is the subtler, but equally compelling generativity associated with everyday thought. One of the most widely noted examples of the latter is our undeniably flexible use of language through which we craft an infinite variety of novel constructions using a relatively small set of rules (Chomsky 1972; Pinker 1984) but there are many other examples as well. For instance the mere fact that we readily construct a vast array of concrete and abstract concepts from an ongoing stream of otherwise discrete experience implies a striking generative ability; concepts are creations (Ward et al. 1999, p. 190).

In discussing learning and creativity, the authors have also introduced here the major role played by language which will be considered in Chapter 3.

Ward et al. (1999) then mention some of the many other transformations that are made. They are necessary to meet goal-driven situations, to change perspectives, to combine concepts, to generate more complex ones, to map properties analogically, to comprehend and produce figurative language, and many other functions that go well beyond the information as directly and literally given.

Argyris and Schön (1974) make the distinction between single-loop learning and double-loop learning. Single-loop learning or “adaptive” learning focuses on incremental change. This type of learning solves problems but ignores the question of why the problem arose in the first place. This kind of learning follows a ladder of

inference where the rungs have already been determined and are not open to challenge or alternatives (Argyris 1990, pp. 88-89). Double-loop learning or “generative” learning focuses on transformational change that changes the status quo. Double-loop learning uses feedback from past actions to question assumptions underlying current views. If single-loop learning occurs when we use the same framework to generate another, improved, attempt to solve a problem but double-loop learning changes the framework, then it would seem that double-loop learning is transformative and arguably creative.

Neville’s (n.d.) view in “Teaching and Transformation” is in some ways similar. He also distinguishes between two kinds of learning, incremental or transformative, quantitative or qualitative:

Incremental learning is learning which is simply added on to what we already know.

They have certainly changed, but the change is in the quantity of their knowledge and skills, rather than in the quality.

They now have more knowledge and skills than they had before, but they need not have changed as people’ (Neville n.d. p. 3).

Transformative learning on the other hand is not just an ‘add-on’ but transforms what is known and understood and can bring about personal change. ‘By contrast, transformative learning is learning which changes someone significantly’. It is enhanced by a teaching methodology which includes telling stories, sharing experiences, facilitation of opportunities and resources, collaborative exploration and relationships of mutual respect. Occasionally, ‘*something happens*, when something they say or do ignites the fuse which leads to a student’s transformation’.

This moment is well known to teachers and is one which fuels their endeavour for a long time. Students who have left school also find it very easy, when asked, to recall such moments from their school careers which, in my experience, almost always include the notion of particular and appropriate care for the student or passion for learning by the teacher concerned.

2.1.2 Theories.

Theoretical work on the relationship between creativity and learning can be divided into three broad categories:

1. Writers and researchers such as Cropley, Runco, Caine and Caine and Jensen who deal holistically with creative learning in theory and practice.
2. A number of research and practical attempts to enhance specific elements of creativity on learning.
3. Learning theories where creativity is implicit.

2.1.2.1 General application of creativity in learning.

In “Creativity in Education and Learning” Arthur Cropley (2001) provides a comprehensive study of basic concepts, the roles of thinking in creativity; personal properties, creativity in adults and children and a number of measurement aspects. His chapter on fostering creativity in educational settings is most relevant in a discussion on creativity in learning.

He states:

Fostering creativity is an integral part of education and should be a guiding light for teaching all children. It should not be reduced to a collection of set exercises carried out at fixed times as part of a “creativity” programme ... The desire to foster creativity is at the heart of a philosophy or principle that should underlie all teaching and learning in all subject areas and at all times (Cropley 2001, p. 151).

This allies with my own thesis and differs from the view of some that only the arts can be taught creatively or that only those students nominated “gifted” should learn creatively. He holds a “quantitative” position in relation to creativity and learning.

He also supports a holistic and interactionist notion of creativity saying that the optimum conditions for creativity exist when all dimensions such as the properties of the person, the situation, the task and the solution are favourable (Cropley 2001, p. 146).

The conditions are then broken down into specifics which Cropley recommends teachers should promote. The way he suggests this might be done is considered in Chapter 8 when I compare a variety of pedagogies with my own.

“Creativity: Theories and Themes, Research, Development and Practice” Runco (2007), as the title suggests, also provides us with a wide range of aspects including those of creative cognition. In general, he discusses theories of incubation, intuition and the unconscious; contradictions and the reconciliation of opposites, “schema” (concepts or complexes in the brain) and “nuances” (gut feelings) as elements of creative cognition, not just creativity.

He also provides a two tiered componential theory. The first tier contains what might be called influences on the process, namely, motivation (intrinsic and extrinsic) and knowledge (declarative/factual/conceptual and procedural). The second tier contains problem finding skills, ideation and evaluation (Runco 2007, p. 31).

He goes on to point out two advantages of this model. One is that it provides the flexibility necessary for creativity to occur through ‘a wide repertoire of cognitive styles’. The other is that the theory includes information and motivation as influences on the creative thinking process. Runco emphasises the need to recognise the importance of motivation: ‘individuals will not put the effort into solving a problem unless they are somehow motivated to do so’. In short, we have here, juxtaposed, two of the central themes in both creativity and creative learning: the intention to create and the knowledge and skills to do so. Promoting this “intention” through a pedagogy is included in comments on pedagogies in Chapter 8 (section 8.1).

Caine and Caine, and Jensen, have each produced a list of “principles” for “brain-based” learning and suggestions for applying them in a teaching context (Caine & Caine 1994, Jensen 1998).

In summary, Jensen's list comprises:

Memory strengthened by frequency, intensity and practice.
Non conscious and automatic behaviours.
Reward and deferred gratification.
Attention limitation.
Meaning making, seeking and understanding.
Prior knowledge and the process of organising information through "rough drafts".
Input limitations.
The influence of perception.
Neural plasticity driven by experience.
The effects of emotion and the physical state (Jensen 1998).

The Caines' list is similar although differently expressed:

Principle One: The brain is a complex adaptive system.
Principle Two: The brain is a social brain.
Principle Three: The search for meaning is innate.
Principle Four: The search for meaning occurs through "patterning".
Principle Five: Emotions are critical to patterning.
Principle Six: Every brain simultaneously perceives and creates parts and wholes.
Principle Seven: Learning involves both focused attention and peripheral perception.
Principle Eight: Learning always involves conscious and unconscious processes.
Principle Nine: We have at least two ways of organizing memory.
Principle Ten: Learning is developmental. Development occurs in several ways.
Principle Eleven: Complex learning is enhanced by challenge and inhibited by threat.
Principle Twelve: Every brain is uniquely organized (Caine & Caine 1994).

These twelve principles are also advocated by Pete and Fogarty (2003), although subdivided into quadrants of interrelated ideas.

As can be seen both lists include many of the traits of creativity. They include making meaning, emotion and transformation of perception discussed in Chapter 1. The view of the brain as "social" is included in Caines' principles but not Jensen's. They have additionally the characteristics of brain plasticity, attention, consciousness, the organisation of information and memory.

However, from the point of view of this thesis there remain some gaps. While there is a clear and well illustrated overall description of the working of the brain in “Teaching with the Brain in Mind” (Jensen 1998), the chapters on how to apply this in the classroom do not include language and creativity, secondary students or actual classroom observations or transcripts.

For instance, in Chapter 10 “The Brain as a Meaning Maker”, one practical application Jensen derives from brain principles is to present the big picture first to improve learning. An example would be to show students a globe and then particularise to countries. This is a useful concept and effective application but is far from documented practice in context.

Similarly, emotion, relevance, attention, and memory are all considered necessary to make meaning and Caine is cited on this (Caine 1994). Jensen says that meaning is made in many areas of the brain: felt in the amygdala, made relevant in the temporal lobe and given context and pattern in the frontal lobes. He emphasises the underlying connectedness of the brain referring to patterns; groups of neurons and connections.

Like Greenfield he says the more associations you make, the more you know and more firmly. He also includes emotion as an important component in thinking. There are again few school examples of this happening. In answer to the question of how we make meaning and relevance and how we make it most of the time, there are many suggestions such as avoid stress, change activities, provide a rich environment but creativity and language are not credited with a major role. The pedagogies they propose arising from these principles will also be considered in Chapter 8 (section 8.1).

2.1.2.2 Specific elements of creativity in learning.

Attempts to enhance specific aspects of creativity in learning have been numerous. There have been efforts to improve thinking and to develop approaches for the classroom including the production of materials for use on an experimental basis. The approaches which follow include these.

An early attempt was the promotion of the process of brainstorming by Osborn (1953, 1963). Group or individual brainstorming is akin to casting about mentally for ideas without the restraint of critical evaluation. As such it encourages divergent rather than convergent thinking. There is no doubt that brainstorming has caught on as a process to evoke ideas not only in educational settings but also in meetings, clubs and political groups. However, the question has been raised whether brainstorming increases creativity or simply increases the expression of ideas by lowering the standard of ideas expressed (Parloff & Handlon 1964, pp. 17-27).

My own view is that three additional and useful qualities may flow from brainstorming: the encouragement of risk taking at a minor and safe level, the group ownership of the final ideas which occur from the social process and the possibility of opposites sparking creative solutions.

Another example of an attempt to improve creative thinking is that of “The Productive Thinking Programme” (Covington, Crutchfield, Davies & Olton 1974) which used a series of self instructional booklets for primary school students to not only improve thinking but also inventiveness and creativity.

The evaluation of the programme had mixed results. Not surprisingly small classes and enthusiastic teachers produced the greatest gains. It has also been suggested that the learning task of solving mysteries as a way of exploring multiple possibilities and several hypotheses was somewhat restrictive. Certainly a creative approach to the whole curriculum was not employed.

De Bono (1970, 1992) is certainly well known on the topic of enhancing thinking and especially his use of the terms “lateral” and “vertical” thinking or “creative” and “critical” thinking. To think “laterally” has certainly become a commonly used phrase. His cognitive research trust (CoRT) proceeds through units in single class lessons. It is a structured approach to problem solving using specified mental operations and mnemonics. Objective data on the programme’s effectiveness is, according to Nickerson, “sparse” (Nickerson 1999 p. 403). Sternberg has gone as far as to describe it as follows:

Equally damaging to the study of creativity, in our view, has been the take over of the field, in the popular mind, by those who follow what might be referred to as a pragmatic approach. Those taking this approach have been concerned primarily with developing creativity secondarily with understanding it, but almost not at all with testing the validity of their ideas about it (Sternberg & Lubart 1999, p. 5).

It may be that one of De Bono's processes with students, that of wearing imaginary hats denoting different kinds of thinking, at least goes some way to promoting metacognition but it seems to be teacher driven and structured fairly narrowly compared to other more authentic creative ventures in classrooms.

The effectiveness of structured approaches to creative thinking represented by the previous three examples is difficult to determine:

... research on the question is fraught with conceptual and practical difficulties.

Most of the measures that might be considered appropriate for the task are not very precise.

The behaviour that efforts to increase creativity are targeting is behaviour in real world (non-laboratory) situations – spontaneous behaviour and typically unobserved behaviour. Such behaviour is difficult to measure directly and the extent to which formal tests of creativity measure the ability or tendency to be creative outside the test situation are questionable (Nickerson 1999, p. 406).

The examples from creativity research which attempt to enhance creativity as a whole, not just creative thinking in particular, are approached differently. They are built around the traits and factors that have already been discussed, which in combination produce creativity. They include both cognitive and personal traits and social, cultural and environmental factors:

In most cases incontrovertible evidence that they will work cannot be given but encouraging evidence can be. I believe that all are consistent with what is known about creativity and its development and, in particular, with what has been learned in the classroom (Nickerson 1999, p. 408).

The examples of research in these areas are numerous and include establishing purpose and intention, building basic skills, encouraging acquisition of domain-specific knowledge, stimulating and rewarding curiosity and exploration, building motivation, encouraging confidence and a willingness to take risks, promoting supportable beliefs about creativity, providing opportunities for choice and discovery, developing metacognitive skills, providing balance and teaching by example.

Two of these may be illustrative. Firstly, when providing opportunities for choice and discovery Dudek and Coté (1994) and Kohn (1993) find that people are more interested - more motivated to engage in – activities they have had the chance to choose for themselves. Two allied characteristics are also supported, the preference for authentic, not teacher contrived, discoveries and the feeling of elation associated with such discovery.

Secondly, when building motivation the consensus in the literature is that internally generated motivation is a more effective determinant of creativity than is external or extrinsic (Amabile 1983, 1990; DeCharms 1968; Deci 1975, 1980; Golann 1962; Hennessey & Amabile 1988; cited in Sternberg 1999, p. 412). It is argued that external motivation can be seen as a means to an ulterior end rather than the end itself, whereas internal motivation sees the creative act as an end not a means. There is a variety of views as to whether the resulting creativity is indeed inferior when motivated externally; the prevailing view is that internal motivation will provide the higher levels of creative productivity.

2.1.2.3 Implicit elements of creativity in learning.

There are also learning theories where creativity is implicit. Inquiry-based learning and problem-based learning are similar theories of learning which markedly differ only in relation to the role of the teacher as facilitator. What they have in common is the emphasis on student problem solving and finding as well as a creative process which leads ultimately to a solution. Discussing problem-based learning and inquiry-based learning Savery (2006) says:

These two approaches are very similar. Inquiry-based learning is grounded in the philosophy of John Dewey (as is problem-based learning), who believed that education begins with the curiosity of the learner. Inquiry-based learning is a student centred, active learning approach focused on questioning, critical thinking and problem solving. Inquiry-based learning activities begin with a question followed by investigating solutions, creating new knowledge as information is gathered and understood, discussing discoveries and experiences and reflecting on new found knowledge (Savery 2006, p.16).

The key difference from creative learning is obviously the absence of a creative product, although often, where these learning theories are used, the solutions are often presented by each group to the others as a final product. These presentations are frequently highly creative including lively performance and engaging technologies.

The learning of literacy is also often enhanced by many of the creative processes we have discussed culminating in the transformation of experience into symbolic form. Mem Fox (2001) in her speech, later published as a paper, “Learning to be a writer: the Wagga Wagga writers’ workshop”, describes vividly the creative process she went through when writing her piece for presentation. From the process she learned what it is that teachers are asking students to do when they require them to write and what it is that really drives the writer to excellence. The week long process included many of the qualities associated with creativity: an authentic task, audience, individual choice, challenge, risk taking, fear, excitement, empathy, trying out and redrafting, group discussion, reflection and of course a clear purpose and product. In retrospect she concluded:

Being a writer in Wagga Wagga provided me with the fundamental understanding that the more writers care about their readers, the more writers fear their readers, the more writers hope for from their readers, the more effectively they will write (Fox 2001, p. 7).

The foregoing research indicates that connections can be made between creativity and learning. The learning theories where creativity is either explicit or implicit and the research into creativity enhancement all indicate the effects of creativity on learning. The research also reveals many of the processes which occur in creative learning and

the consequences of applying them. The following section will investigate the nature and processes of creativity and learning within the human brain, ‘the subtler, but equally compelling generativity associated with everyday thought’ (Ward et al. 1999, p. 190).

2.2 Cognitive psychologists and neuroscientists.

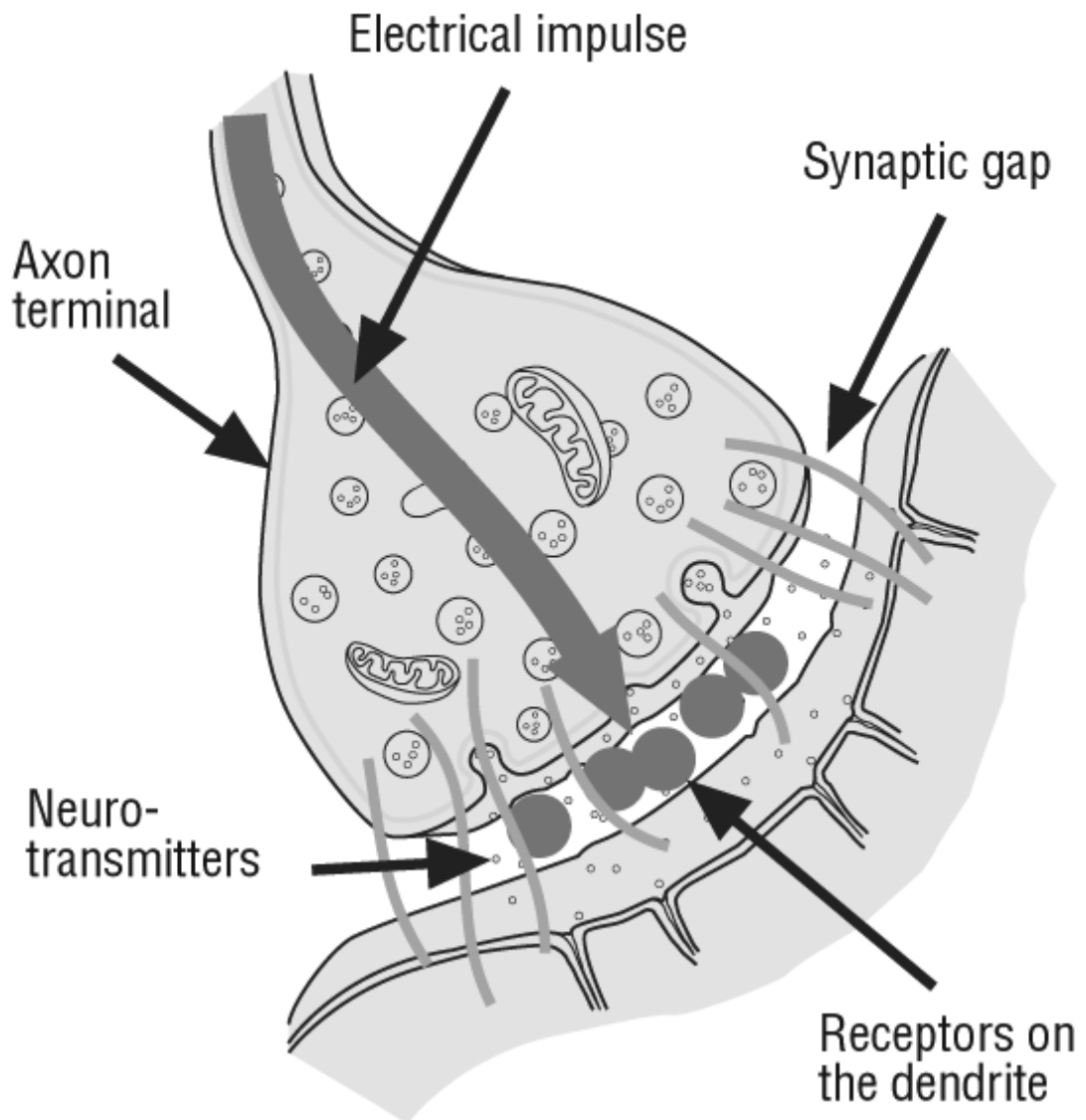
2.2.1 The territory.

Before embarking on aspects of learning, the brain and creativity, it may be useful to briefly sketch out the territory. There is no disagreement between any of the researchers discussed on the physiology of the brain; its biological, chemical and electrical components. ‘Whether you are 2 or 92, your brain is a cauldron of changing chemicals, electrical activity, cell growth, cell death, connectivity, and change’ (Jensen 2005, p. 5).

They agree that there are around 100 billion neurons in the brain. Neurons organise themselves into groups and each group becomes specialised for processing a specific type of stimulus. All the communication between neurons occurs at the synaptic junctions. Dendritic spines (tiny protuberances on the dendrites of the neuron), make contact with the synapse of the nearest neuron(s). They make contact by facilitating transmission of chemicals across the synaptic gap. The connections made by the neurons in circuits are by electrical impulse with a chemical transmitter used across synapses, ‘... a molecular handshake with the receptor ... the basic building block of virtually all brain operations’ (Greenfield 2000, p. 7).

Under certain conditions, these dendritic spines can shrink away and break contact; under other circumstances they (or new ones) grow to make contact. The more one neuron activates another neuron, the stronger the connection between them grows, ‘What fires together, wires together!’ (Blakemore & Frith 2005, p. 133).

The Synapse—Where Learning Takes Place



This most clear and succinct diagram of the process is taken from Eric Jensen’s introductory chapter “Meet Your Amazing Brain” (Jensen 2005, Figure 1:9).

2.2.2 The links between creativity, learning and cognitive psychology.

Constructivist cognitive psychologists, principally Eric Jensen and Renate N. Caine and Geoffrey Caine, are particularly concerned with the brain, how we learn and the applications of this in the classroom.

In his book “Teaching with the Brain in Mind”, Jensen (1998) elaborates his principles and provides examples for use in schools. Some of the comments he makes are particularly helpful in understanding learning and the transformational process of creativity:

The second essential feature of the brain is integration, or strong connectivity. That means many areas connect to and influence other portions, so that specific sections of the brain may contribute separately and collectively to your sense of self. In short, one critical quality that makes the brain work so well is its degree of connectivity, not its individual structures (Jensen 2005, p. 4).

If the qualities of “connectivity” and “integration” are important in the working of the brain as he suggests, then it might explain what happens when we link ideas, sometimes apparently unconnected ones, in the creative act and that if this connecting is encouraged it might enhance both learning and creativity. It may even be that learning creatively stimulates such connecting.

Another link between learning and creativity is also made by Jensen. He says:

If it's worth a second consideration, new explicit learning is routed to and held in the hippocampus. There the information is processed further to determine its value. If the new learning is deemed important, it will be organized and indexed by the hippocampus and later stored in the cortex. In fact, it will be stored in the same lobe that originally processed it—visual information in the occipital lobe, language in the temporal lobe, and so on. The original processing takes place at lightning speed, but the subsequent stages and storage process can take hours, days, or even weeks (Jensen 2005, p. 10).

There are two comments here which may be particularly relevant to learning creatively. First, the statement that new learning ‘deemed important’ leads to storage in the brain for later use is of considerable significance to education. Making new learning important for the learner is obviously desirable and such engagement, I argue, is more likely to come if the student is creatively involved with solving a problem or making sense of something. Secondly, the reference to subsequent stages in the storage process taking a long time also fits with the notion of “incubation” a key characteristic of creativity.

Lastly, one other comment in Jensen's comprehensive introduction to the brain and learning, which links to an extremely common but vital brain function in the act of creativity, is the "as if" process. The leap of imagination described by both Einstein and Webster and the modifying and improving of the product through regular reflection, referred to in the previous chapter, are also implicit here, 'Input to the brain arrives from the five senses or is generated internally through imagination or reflection' (Jensen 2005, p. 9).

It is clear that both psychologists include some of the characteristics of creativity discussed in Chapter 1 in their discussion of learning. The qualities of creativity and learning often seem parallel.

Creativity is also considered directly in a later Jensen book "Arts with the Brain in Mind". While there is a great deal of support for learning in the arts, mirroring many of the qualities, principles and outcomes found in the NACCCE report, creative learning is still seen as occurring only in the arts domain of the curriculum rather than a way of learning across the curriculum.

The essential points he makes in support of learning through the arts are that the tasks fit his seven basic features of a major discipline:

- They are assessable.
- They are brain based; certain areas of the brain respond specifically to arts subjects.
- They are culturally necessary.
- They are without risk.
- They are necessary for species survival
- They are inclusive.
- They are wide ranging (Jensen 2001).

Presumably this assertion was necessary in a period of cuts in arts education due to budgetary constraints and educational movements from "Back to Basics" to high-stakes testing. Whatever the reason, most of the statements seem self-evident with the exception of the brain response claim. This rests on correlations found between music

and IQ through a study of brain coherence, or connections among sections of the brain, as measured by electroencephalogram (EEG). He says that they enhance success in other subjects:

- Where music education is required of all students in other nations they achieve some of the highest mathematics and science test scores in the world.
- They improve other areas:
- Research from the studies discussed in this book and the experience of countless classroom educators support the view that visual arts have strong positive cognitive, emotional, social, collaborative, and neurological effects (Jensen 2001, p. 68).
- They are about being human and develop over a long period of time:
- The arts “are about life, growth, and expanding who we can become as human beings (Jensen 2001, p. 110).

The omissions are:

- The absence of any analysis of the role of language. Even literary arts such as creative writing and drama are not mentioned.
- The suggestions offered for educational activities and ideas in practice could be considered quick fixes rather than being part of genuine integration into arts education. There is certainly no attempt to locate the learning associated with the arts across the curriculum.

Before leaving the consideration of some of the pertinent aspects of creative learning to be found in two constructivist cognitive psychologists, the unique South Australian initiative “Learning to Learn”, a DECS (Department of Education and Children’s Services) project should be noted. It has operated from 1999 and continues its work today. It involves over a hundred school sites and through its state wide networks of teachers, its website and recently produced CD, offers a variety of strategies, documented in detail, from schools. They are based on the latest educational research largely by Caine and Jensen and other cognitive psychologists who are partners in the project. However, again, from the point of view of this thesis, the school reports lack analysis of the role of language and creativity and, at this stage, secondary school examples.

2.2.3 The links between creativity, learning and neuroscience.

What can be learned from neuroscientists in relation to learning and creativity? Their research tends to be done in two ways:

- Physiological – clinical studies, observing, examining and testing the responses of patients with known areas of brain damage, through animal and human testing and autopsies.
- Technological – observing the brain's responses and working through magnetic resonance imaging (MRI); nuclear magnetic resonance imaging (NMRI) which is 30K faster, processing 1 image every 50 milliseconds. Other brain imaging techniques used are: positron emission tomography (PET); computerised axial tomography (CAT) scans, electroencephalograph (EEG); magnetic encephalograph (MEG) where the magnetism shows up neural networks; spectrometers for neural transmitters in the frontal lobe and other scanning devices.

Recent work in neuroscience is broadly consistent with the earlier work of the cognitive psychologists already discussed. However, they provide more detailed observation of several of the brain's processes and some neuroscience now shows how the linguistic processing necessary for creativity occurs in the brain.

2.2.4 The brain's role in creativity and learning.

2.2.4.1 General brain function.

The general functioning of the brain was briefly outlined at the beginning of this chapter but there is one additional finding from neuroscience which is particularly pertinent to secondary teaching and the role that creative teaching might therefore play.

It is the second big wave of brain development in adolescence. Blakemore and Frith report that physical and hormonal changes are well documented but there is little

empirical research on the development of cognitive skills and the brain during puberty and adolescence or scientific evidence about cognitive and neural development during this important period of life (Blakemore & Frith 2005, pp. 111-112).

However, what is known is pertinent to this research. There are frontal cortex changes which are responsible for executive functions including the ability to inhibit inappropriate behaviour, plan, select actions, hold information in the mind and do two things at once (Blakemore & Frith 2005, p. 113). These would seem significant given they are an important part of what students are learning from years 8 – 10; they add up to maturity!

The authors explain that although the volume of brain tissue remains stable there is an increase in white matter in the frontal cortex after puberty and that within this white matter, as neurons develop, they build up a layer of myelin on the axons which is an insulator and increases the speed of transmission. At the same time there is a large decrease in the density of synapses in the frontal cortex.

This is pruning (similar to what happens at one year old approximately) and essential for fine tuning and functional networks of brain tissue and perceptual processes (Blakemore & Frith 2005, p. 113). This event suggests that intellectual and social developments are not set by this period and therefore challenges the appropriateness of 11+ and other testing before and during this age as indicators of future success. They express the view:

If 0-3 years is seen as a major opportunity for teaching so too should 10- 15 years. During both periods particularly dramatic brain reorganisation is taking place. This may well be a signal that learning in certain domains is becoming ultra fast during these periods (Blakemore & Frith 2005, p. 121).

These findings lend urgency to the need for successful learning in the adolescent years.

2.2.4.2 Plasticity and connections.

In addition to the development of the adolescent brain, another highly significant feature revealed through neuroscience is the ability of the brain to keep learning throughout life. This adaptability or “plasticity” of brain cells continues as long as we live. They grow and wither, shaped by experience. Using our brains in unfamiliar or creative ways may encourage new connections to form.

Through the research of Eleanor Maguire new growth in the brain as a result of intensive learning could be observed. It showed that a region of the hippocampus in the brains of London taxi drivers actually increased in size after memorising all the street names of London. The drivers had to do this in order to pass a test to be employed (Maguire 2000, p. 4). Interestingly this knowledge acquisition was a result of very powerful motivation (long term future paid work) and used mnemonics and spatial imagery to locate the whereabouts of myriad streets and buildings. The importance of intention, memory and imagery will be discussed at length later in relation to both learning and creativity.

There is general support then from psychologists and neuroscientists that learning over a life time can and does occur. We are also made aware, by this relatively simple general and accepted description of the brain’s functioning, that neuronal connections are central to the process.

It is not, however, a *fait accompli* that such a view is shared, even at the top levels of education. For example, Fraser Mustard, Adelaide’s “Thinker in Residence” in 2007, stated, ‘By the age of three a child’s verbal skills have peaked ...’ (Mustard 2007, p. 15).

This view was promulgated not only in the press and allied media but also at primary teachers’ conferences across the state of South Australia. My response can be found at Appendix (1). The view of neuroscientists and cognitive psychologists discussed here is that it is not the case that verbal skills have peaked but rather that the neurological framework, unique to humans, which allows us to talk, think, make meaning and represent the world to ourselves, has been established. It continues to grow and extend.

Furthermore, Blakemore and Frith, like many others, suggest that where questions or problems are posed, or where new knowledge or skills are actively sought, new neural connections are made. Solving different kinds of problems will produce different kinds of thought processes as we search for solutions. Questioning and problem solving are therefore important for new connections to form. In evolution, new abilities do not usually appear out of the blue. They often build on existing latent abilities. They are also, as we have seen, characteristics found in creativity.

Learning should therefore stimulate and encourage questioning, problem-posing and the intention to acquire new knowledge making new and more extensive connections in the brain. Since a commonly agreed characteristic of creativity is the combination of known items or ideas in a new and different, often contrasting, way, the connections would appear to be vital to this process too.

2.2.4.3 Integrated process.

The view that there are different, discrete areas of the brain which are responsible for particular functions has now largely been discredited. There is overall general agreement amongst neuroscientists that the brain does not function in a compartmentalised way but rather as an integrated and complex system using many brain areas interactively.

There are, however, different views on the mechanism by which this occurs. These propositions are worthy of comment in so far as they have relevance to learning and creativity.

Greenfield says that the basic working unit is a brain cell (neuron), but more important still are the circuits of brain cells that then grow into complex assemblies that form recognisable macro brain structures.

She likens each of these brain structures to an instrument in an orchestra or an ingredient in a complex dish of food performing many functions, according to the combinations and the degree to which they are operating at one moment.

She points out that in the act of vision there are at least thirty different brain regions involved and that there is a ceaseless interaction between input from the environment and the chemistry of the brain that will lead to changes in brain cell connectivity that, in turn, will determine, literally, how we see the world (Greenfield 2006, p. 6). She hypothesises that what connects these various circuits and areas of the brain are the chemical “peptides” (Greenfield 2000, p. 179). This would seem to indicate then that making connections leads to an active, learning brain. What is less clear is whether there are any particular environments or activities which increase the making of connections to improve brain activity and learning. Could creativity be such a catalyst?

Damasio is also unequivocal on compartmentalisation of the brain (Damasio 2006 p. xxiii). His description of neuronal connectivity and neuronal assemblies concurs with Greenfield’s (Damasio 2006, p. 19). He adds a new concept though, one which breaks down the assumption that the brain is somehow separate and independent of the body, ‘The brain and body are indissociably integrated by mutually targeted biochemical and neural circuits’ (Damasio 2006, p. 87). This concept is elaborated upon by Candace Pert. Her research has suggested that all of the senses, sight, sound, smell, taste and touch are filtered, and memories stored, through the molecules of emotions, mostly the neuropeptides and their receptors, at every level of the body-mind (Pert 1999, p. 126).

Damasio also breaks down another invisible barrier, that between emotion and reason, ‘Both ‘high level’ and ‘low level’ brain regions, from the prefrontal cortices to the hypothalamus and brain stem, cooperate in the making of reason’ (Damasio 2006, p. xxiii).

Damasio’s emphasis on the importance of emotion may also form a link between creativity and brain function given that so much creativity has been described as involving feeling and sensation. He also stresses the effect of experience on the functioning of the brain. He says that different experiences cause synaptic strengths to vary; experience shapes the design of circuits which can change throughout the life span to reflect different organism experience. They are repeatedly pliable and modifiable by continued experience with some circuits remodeled over and over throughout life while others remain mostly stable and form the back bone of the notions we have constructed about the world within, and about the world outside.

The galvanising process of human thought in the brain for Damasio is not the presence of peptides as for Greenfield or, as we shall see shortly, language for Zoltan Torey, but ‘the upstairs and the downstairs, the neo cortex becomes engaged along with the older brain core, and rationality results from their concerted activity’ (Damasio 2006, p. 128).

Damasio’s observations parallel the characteristics identified above - brain plasticity and lifelong learning, shaped by experience, and the necessity for neuronal connections in this process. However, he adds feelings and emotions to the mix to promote not just learning and creativity as we would expect but also “rationality”.

For Torey, the process of human thought is integrated by neither peptides nor emotion but the ability to represent the world to ourselves, making meaning through symbol and language. He considers that brain weight, brain volume, or the number of neurons do not by themselves account for the remarkable upgrading of our central nervous performance. Homo erectus and homo sapiens show little difference in brain size. He believes the answer is the rearrangement that supports the brain’s functional autonomy, which is a new circuitry, an off-line language loop that is the basis of internal communication.

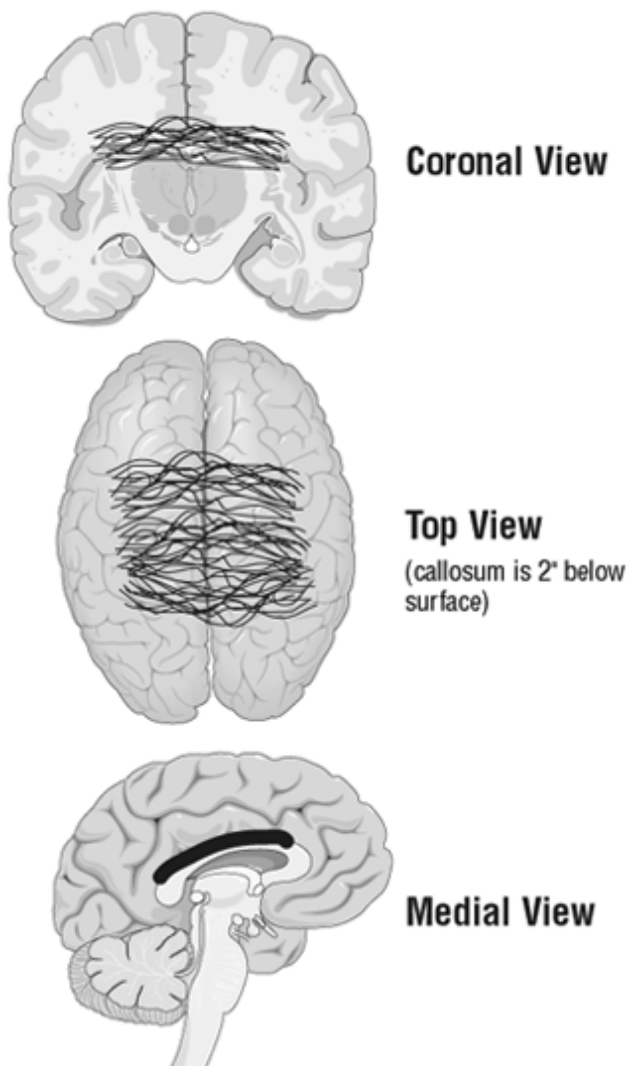
This is made possible by neoteny (allowing for post natal neural growth); critical brain volume for speech being reached at 1 not 6 as was the case with homo erectus; optimal brain plasticity and the neuronal branching potential for wiring up the left hemisphere’s manipulo-spatial area for “verbal” percept handling (speech). This has to be done before the original function (the physical handling of objects) can lay claim to the area (Torey 1999, p. 38). He says if the early neuro-plastic period passes without exposure to speech, the potential is lost and later attempts to learn the skill prove futile (Torey 1999, p. 55).

Torey’s description of the process of integration of brain functions shares many similarities with Greenfield and Damasio. However, the model of new neuro circuitry, involving right and left hemispheres in an oscillating process involving language in all intentional acts of thought and action is different.

He describes the system as follows. The brainstem activates the arousal system that directs the attention to the interhemispheric transactions that are necessary for human cognition. The neocortex defines the organism's continuously changing sensory and motor situations and through the corpus callosum, the dense bundle of nerve fibres which connect the two hemispheres, the new interhemispheric transactions are created and maintained (Torey 1999, p. 22).

Three Views of the Corpus Callosum

The approximately 250 million nerve fibers of the corpus callosum connect the brain's two hemispheres.



(Jensen 2005, Figure 1.6)

The forebrain (cerebral hemispheres covered by neocortex) evolves higher functions (including mind, reflective awareness and mental phenomena), while archaic forms of brain structure are retained for more or less automatic tasks (Torey 1999, pp. 22-23).

Torey shares with Greenfield and Damasio the view that the brain functions in an integrated and interactive way and that neuronal plasticity is affected by experience. The major difference is his explanation of the process by which this happens, which is through language.

The brain's integration of function between hemispheres is also referred to by Blakemore and Frith (2005, p. 57) and they also comment on the handling of number in relation to language, 'So it seems that the right hemisphere approximates while the left hemisphere calculates' (Blakemore & Frith 2005, p. 59). They add that recent evidence lends further support to the idea that exact calculation is dependent on language, while approximation relies on non-verbal visual and spatial brain networks (Blakemore & Frith 2005, p. 61).

Language receives scant emphasis from Greenfield, rather more from Damasio (see below) but it is seen as an essential vehicle for human brain function by Torey. Since language is also the most obvious way to find out what the brain is thinking and learning as well as being the stuff that many creations are made of, not to mention a major teaching and learning medium, the next chapter will be devoted entirely to the role of language in creativity and learning.

2.2.4.4 Role of images.

The importance of images, or representations which may be used symbolically, is emphasised by a number of neuroscientists. They appear particularly important to thought, learning and creativity and are worthy of greater discussion here. Greenfield writes, 'The hallmark of the quintessentially human brain is the ability to see things in terms of other things, metaphorically or symbolically' (Greenfield 2003, p. 257).

Damasio stresses the importance of images in thought and reason with language in a supplementary role. For him thought is the ability to display images internally and to

order them. The images are not solely visual; there are also sound images and olfactory images (Damasio 2006, p. 89).

A key difference between Damasio and Torey, and an important one in terms of teaching and learning, is whether images alone constitute thought or whether language is needed to manipulate, modify and create them.

Their role in learning is clear in two ways, both to do with experience. In the first instance the neuronal representations we make become images we each experience as belonging to us (Damasio 2006, p. 90).

These various images – perceptual, recalled from real past, and recalled from plans for the future – are constructions of your own organism’s brain. All that you can know for certain is that they are real to yourself, and that other beings make comparable images (Damasio 2006, p. 97).

Secondly, imagery is the way in which we learn by building on prior experience and knowledge:

Some of those dispositional representations contain records for the imageable knowledge that we can recall and which is used for movement, reason, creativity ...The acquisition of new knowledge is achieved by continuous modification of such dispositional representations (Damasio 2006, p. 105).

For Torey language is more than just being supplementary to images. He asserts that the self-aware human brain is unique. It generates in us the image of the world and the experience of our having this image. He says there is reason to believe language lies at the heart of the matter. This differentiates it from animal awareness where data are being added to ongoing sensory totalisation. It is trapped without being aware of it. He says by contrast, human awareness has escaped the trap of inaccessibility. The breakout is the result of language, the motor facility that empowers the brain to handle neural representations (its percepts) internally. The marshalling and uttering of word-linked percepts creates self generated experience (Torey 1999, pp. 14-19).

A link between the image, feeling and the word is also referred to by Blakemore and Frith. They say that to recall a word, especially one which seems lost, we have a feeling about the sound of the word, how many syllables it has, or what letter it starts with:

The left pre frontal cortex which is thought to be involved in retrieving information from memory is activated when subjects correctly retrieve words. However, when people have a word on 'the tip of their tongue' this region is not activated and many other brain areas become activated instead perhaps reflecting the hard effort to retrieve the word (Blakemore & Frith 2005, p. 157).

Being blind, Torey talks about how he brings up the image he thinks he is seeing and then modifies it in the light of other sensory and verbal information. He remarks that this is the opposite of what people with sight do:

My brain, formerly there to perceive the world through sight, now, in response to the demand for a high-grade substitution for it, began using its processing techniques in reverse. Previously it perceived and made inferences on the basis of visual data, now it gathered any data, data formerly ignored, and together with shrewd guesses it generated perceptions from within (Torey 2003, p. 150).

As sighted people, we hold images and recall those that 'we've stashed away' when they are not actually visible. We locate and objectify them through language. He continues:

Language is the source of an active self sensation and of an experience of self generated output; the percept is a stabilised product of a sensory modality – suitable for word linkage and language delivery (Torey 1999, p. 24).

He gives as an example the image of a tiger (stable percept) linked to the word 'tiger': the two form a word percept, the semantic unit of speech. While the semantic unit that is being communicated is the percept or concept, it is the word (the symbol) that can be uttered and conveyed. Word and percept stand for one another and constitute the building blocks with which the speech capable brain generates entirely novel combinations (Torey 1999, p. 24).

An unusual and compelling description of the image in thought being transformed into words is in the poem by Ted Hughes:

The Thought Fox.

I imagine this midnight moment's forest:
Something else is alive
Besides the clock's loneliness
And this blank page where my fingers move.

Through the window I see no star:
Something more near
Though deeper within darkness
Is entering the loneliness:

Cold, delicately as the dark snow,
A fox's nose touches twig, leaf;
Two eyes serve a movement, that now
And again now, and now, and now

Sets neat prints into the snow
Between trees, and warily a lame
Shadow lags by stump and in hollow
Of a body that is bold to come

Across clearings, an eye,
A widening deepening greenness,
Brilliantly, concentratedly,
Coming about its own business

Till, with sudden sharp hot stink of fox
It enters the dark hole of the head.
The window is starless still; the clock ticks,
The page is printed (Hughes 1968, p.108).

Hughes's own discussion of the poem points clearly to the power of imagining and creation:

So, you see, in some ways my fox is better than an ordinary fox. It will live forever; it will never suffer from hunger or hounds. I have it with me wherever I go. And I made it. And all through imagining it clearly enough and finding the living words (Hughes 1967, p. 21).

I have tested myself in relation to a forgotten word and the attempt to call it up through the image I see of it. My 'finding the word' journey was as follows.

I found and collected some THINGS from the beach that I know are good for canaries and budgerigars which I keep in aviaries. They help to sharpen their beaks and also provide calcium input. I showed my husband who named them but I forgot the name.

Some weeks later I remembered that I had collected them and eventually found where they had been stored from my husband without naming them.

I placed them in the aviaries and our family noticed how much the birds used them. My daughter named them.

A couple of weeks later, I realized that yet again I could not remember the name, so, as an experiment I:

- Called up the image of them in a variety of settings - no result.
- I thought of associated words which were, in this order, scampi, squid, calamari – also no result.
- After several days of trying I happened by chance to see a spare one through my bedroom window lying on the lattice near the aviaries. I concentrated, I thought of the associated words again – and then I saw and heard at the same time the letter T. I said to myself turpo, turko and so on, and then CUTTLE!

It was finally image and sound together that gave me the word; that made the connection which had obviously previously not been made or been lost.

I recalled some knowledge of the progress of dementia or “Alzheimer’s” where, as the neural connections disintegrate, it becomes more difficult to call up the word although the image can be seen in the mind and recently acquired words are gradually lost until only those embedded in the brain very early remain.

I began to ask myself whether the words I remembered easily, which were associated for me with the cuttle fish, might have been laid down earlier in my life.

‘Scampi’ was very early (1950s) and its association is fairly oblique given that it is a prawn fried in batter – the only similarity being the common method of cooking ‘squid’. The latter word and the word ‘calamari’ were both familiar to me only by the 80s when I came to Australia. Although I saw cuttle fish on the beach at this time I did not associate them with squid until much later. It’s not after all until you know that a squid is a cephalopod with a calcareous internal shell that the connection is really clear. I think therefore that the connections made earlier were more deeply embedded than the later one and that the grouping of these images and ideas is probably now better connected. I decided to see if I could recall the word in a couple more weeks; I did and I still can!

I conclude that the known word conjures up the image but the image does not necessarily call up the word if the connection is not made, either because it hasn’t been learned or the connection has been severed.

If imagery, emotion and symbol are necessary for human thought then plainly they are involved in learning. Creative learning may offer opportunities for activating and linking the three as we seek to make something new and transform what we know.

If imaging is pivotal to thinking and planning ahead; reflecting; thinking abstractly or symbolically; knowing and reasoning, then imaging may need to be emphasised in any list of characteristics of brain function relevant to pedagogy and calling up the image, or imagining, practised frequently in learning.

What significant features of the overall working of the brain emerge from the views of these neuroscientists thus far? What can we glean in relation to learning and creativity?

- The brain operates across many areas; it functions in an integrated and interactive way; there is no one on one match in terms of function.
- The brain continues to grow, (neuronal plasticity), and change throughout life.
- Experience crucially affects the brain's operations as does getting neurons to connect and grow into assemblies or structures.
- The involvement and effect of emotion.
- The use of language in cognition.
- The particular significance of the brain's manipulation of images and words into abstract thought.

2.2.4.5 Emotion and rationality.

We have seen in the last section a brief indication of Damasio's views in relation to feelings, emotion and rationality. Emotion is often associated with creativity and social learning. If, as Damasio argues, it is also significant in reasoning then it may be worthy of additional comment. He generalises thus:

In short there appears to be a collection of systems in the human brain, consistently dedicated to the goal-oriented thinking process we call reasoning, and to their response selection we call decision making, with a special emphasis on the personal and social domain. This same collection of systems is also involved in emotion and feeling and is partly dedicated to processing body signal (Damasio 2006, p. 70).

It seems then that it is important to learn to empathise not only for social or moral reasons but also for reasoning and decision making. If the “art” / “science” dichotomy, the “reasoning,” / “feeling” divide is false and the two are not separate but connected then the notion of creative learning across the curriculum, including in science and maths, is advanced.

Damasio here refers specifically to the effect on response selection or decision making. Damasio's main human subjects, who both had brain damage in the pre frontal cortices, Phineas Gage and Elliot, both “knew” but could not “feel”. As a result they were compromised when making decisions because of the difficulty of choosing from many options without the value or weighting supplied by (gut) feeling (the somatic marker hypothesis).

Damasio defines somatic markers as, ‘A special instance of feelings generated from secondary emotions. These emotions and feelings have been connected, by learning, to predicted future outcomes of certain scenarios’ (Damasio 2006, p. 117).

Three examples are provided: the injured client who spent a great length of time making a medical appointment by going through the almost endless options without being able to make a decision; the driver who could continue to drive on a dangerous icy road despite seeing a shocking accident in front of him; and the gamblers who recognised the system being used but could not choose to change their play even though they knew they were losing.

These references to the role of feelings, and that they are learned, raise the significance, relevance and possibly the great power of “as if” work and enactment in education.

There are many incidents and experiments which have shown that the recollection of an experience, expressed in words, can demonstrate physiologically, to varying degrees, the emotion of the original experience. Brain imaging studies have shown that at least two thirds of the same brain areas are activated when you imagine an object compared with when you actually see the same object. So mental images of objects and events can engage much of the same processing that occurs during the corresponding perceptual experience. The same is demonstrated when a movement is made or envisaged (Blakemore & Frith 2005, p. 165).

Imagining an emotional situation can also affect the body almost as much as actually experiencing it. It has been claimed that heart rate, respiration, producing gut feelings and even hormonal and immune systems can be affected (Blakemore & Frith 2005, p. 158). It is certainly commonplace in grief counseling, for instance, that re-telling experiences brings back the emotion of the original event. It is also the subject of further research into placebos, why they work and the extent to which mind affects body in a medical situation (Blakemore & Frith 2005, p. 183).

Damasio says:

The somatosensory cortex works as if it were receiving signals about a particular body state, and although the “as if” activity pattern cannot be precisely the same as the activity pattern generated by a real body state, it may still influence decision making (Damasio 2006, p. 184).

The effect of “as if” experiences on feeling and learning has also been validated elsewhere in experiments. Blakemore and Frith cite the work of Steve Kosslyn and his colleagues who found that not only does imagining an emotionally aversive situation affect the body almost as much as actually experiencing it, visualising aversive events is also processed by the emotional brain. The authors state, ‘The finding that people can affect their body’s emotional state by forming visual images has implications for learning’ (Blakemore & Frith 2005, p. 158).

That forming visual images can affect the body’s emotional state and has implications for learning is particularly relevant in creative teaching where discussing, enacting and transforming intense and emotionally charged issues are frequent. This happens in English lessons, particularly reading and writing poetry, as well as drama.

More surprisingly, imagery can also play a part in learning to play the piano. In Alvaro Pascual-Leone’s piano playing experiment people who did not play the piano were divided into three groups and played a piano for two hours a day for five days. Group 1 was merely exposed to the piano and could play around with it; Group 2 started to practise five finger exercises; Group 3 had to imagine they were playing the exercises. Not surprisingly in the area of the brain relating to the movement of digits Group 2 expanded much more than Group 1. However, Group 3 (the imaginers) had brain changes almost as impressive as Group 2 (the players) (Pascual-Leone 2001, pp. 316-321).

Damasio also notes that in addition to reasoning and deciding being affected by feeling that injured patients were unable to organise future activity and hold gainful employment; they lacked originality and creativity (Damasio 2006, p. 58).

Damasio places considerable value on creativity. He traces decision making through an evolutionary perspective suggesting that just as the individual brain can grow and

change so can human brains collectively over time through natural selection. He goes from the oldest decision making device of basic biological regulation, to the personal and social realm, and then to the most recent, which he calls a collection of abstract-symbolic operations under which are found artistic and scientific reasoning, utilitarian-engineering reasoning, and the developments of language and mathematics. He suspects that these are interdependent. He says ‘When we witness signs of creativity in contemporary humans, we are probably witnessing the integrated operation of sundry combinations of these devices’ (Damasio 2006, p. 191).

The interdependence and interconnectivity of brain operations which he contemplates may be present in creativity, and is not at variance with the views of other neuroscientists, but he adds to this an important role for imagination:

Second, a large capacity for manipulating the components of those memorised representations and fashioning new creations by means of novel combinations. The most immediately useful variety of those creations consisted of imagined scenarios, the anticipation of outcomes of actions, the formulation of future plans, and the design of new goals that can enhance survival (Damasio 2006, pp. 263-264).

This is either not mentioned by other neuroscientists or, by Torey, is seen in a subordinate role to language.

The link between this collection of systems and learning and creativity is made strongly here. How these systems are optimally activated in learning is not discussed but it has been argued here that they work through feeling, imaging, memory and high level thinking and reasoning, certainly relevant areas in education.

2.2.4.6 Neuronal connections.

Neurons have been frequently referred to when describing brain function above. Like emotion they seem to play a very large part in thinking and may therefore also merit some additional discussion in relation to learning and creativity.

A good starting place is Susan Greenfield's belief that learning is about making new neuronal connections; that they are fashioned on an ongoing basis by personal experience; and that they form the unique human mind. She says, 'This forging of new connections, which has a direct basis in the connections between neurons, is surely the essence of learning' (Greenfield 2004, pp. 152-153). To influence this crucial growth is stated as important in learning but how to do so or how to know that it has occurred is not discussed.

2.2.4.7 Categorisation.

There may be one clue. Damasio, Greenfield, Torey and other scholars in the field all refer to the necessity for categorisation or assemblage of similar neurons to occur in the thinking process. This could be an abstract generalisation that holds together a number of individual, concrete associations allowing images to be conjured up quickly under its umbrella.

For example, a current issue is "global warming". This general, abstract term immediately calls up images, subsets and ideas in a mature mind. Listening, discussing and reading provide more of these until this generalisation can eventually summon up whole arguments, statistics, views, knowledge, predictions and so on. It is an essential highly developed brain function often referred to as higher order thinking (Bloom 1956, pp. 201-207) but it has to be learned, largely, in the adolescent period.

In my analysis of learning in the classroom, I have called this phenomenon the "coat hanger" upon which examples and additional material can be hung, added to or discarded. For Greenfield it is:

The more sophisticated the brain the more connections there are; more connections allow for meaning and the basic working unit is a brain cell (neuron), but more important still are the circuits of brain cells that then grow into complex assemblies that form recognizable macro brain structures (Greenfield 2001, p. 169).

Torey describes the process as 'Humans perceive objects and events so that they fit in with acquired or learned class criteria' (Torey 1999, p. 25).

There are other references to this phenomenon in “The Crucible of Consciousness”. Torey discusses denotation and connotation in the brain. For example, if the denotation or word-object is “red shirt”; the connotation is “coloured clothing”. The connotation is the broader category or surround. The integrated output of word and percept is more than an enriched product. Language forces the shift of attentional focus from denotation to connotation and back again. Torey (1999, p. 8) predicts, based on the experimental findings of Gazzaniga et al. (1992), that injured or surgically separated hemispheres would cause the quality and subtlety of the left brain’s experience to be markedly diminished.

I think that the relationship between the denotation and the connotation; the tight focus of a named object against its back ground of broad meaning and implication (Torey 1999, p. 26) is another way of describing, and a further explanation of the “coat hanger” effect.

Damasio also refers to categorisation but in a different way, he says that the brain:

... momentarily constructs and stealthily manipulates the images in our minds. On the basis of those images...we can interpret the signals brought in at the early sensory cortices so that we can organise them as concepts and categorise them (Damasio 2006, p. 93).

John T. Bruer in “Education and the Brain” comments:

The mature nervous system has fewer synaptic connections than were present during the developmental peak. It is the pattern, rather than simply the number, of these connections that form the mature brain’s neural circuitry and that support normal brain function (Bruer 1997, p. 5).

Vygotsky says that each word is already a generalisation. Generalisation is a verbal act of thought and reflects reality quite differently from the way in which sensation and perception reflect it. However, generalised concepts come only with maturity at the advanced stage in the development of word meanings, ‘Thus, true human

communication presupposes a generalising attitude, which is an advanced stage in the development of word meanings. The higher forms of human intercourse are possible only because man's thought reflects conceptualised actuality' (Vygotsky 1962, p. 7).

In the NACCCE Report the power of performance is related to the notion of the coat hanger, 'Dance gave us a hook upon which to hang the rest of our learning; without it many of her students would not be here to substantiate this story' (NACCCE 1999, p.292).

Finally, the process of finding the coat hanger and using or adding to the clothes on it is possible according to Torey only through the word, 'It is the word that empowers the brain to dip into its store of stable images and to generate and communicate its experience' (Torey 1999, p. 64).

If this is so, whether referred to as a category, assembly, class criteria, surround, peg, hook, constellation, scaffold, pattern or coat hanger, it is surely an essential tool in learning and creativity, enabling us to both comprehend and extend our world.

2.2.4.8 Other views.

Another writer and influential educator in the field, Howard Gardner, might appear to disagree on one of the fundamental points here, that of the compartmentalisation of the brain into discrete parts for particular activities. In "Frames of Mind, the Theory of Multiple Intelligences", he proposes that intelligence is not a single faculty and lists the criteria as separate entities. These are: linguistic, logical-mathematical, musical, bodily-kinesthetic, spatial, interpersonal and intrapersonal intelligences (Gardner 1993).

This notion has been criticised on the grounds of basis, evidence and testability (White 1998). Despite this there is no doubt that teachers, particularly in the United States, England and Australia, have taken up Gardner's compartmentalised aspects of brain function in learning and often embellished it as a tool to assist and enhance teaching in their classrooms. Researching Gardner's work, Kornhaber (2001) claims the model, '... provides education and educators with a conceptual framework for organising and reflecting on curriculum and students' (p. 276).

However, it is particularly worthy of note in this context that Gardner has said that each intelligence develops separately but rarely operates independently.

David Chalmers is a philosopher specialising in the philosophy of mind, who also writes, as a philosopher, about the neurosciences. He cannot be incorporated into the prevailing views. On the contrary, he maintains (1996) that nobody is an expert on the how the brain works; it is an open science with only piecemeal progress. He says that even the fundamentals are not known and MRI tells us little. He believes that we know best about our mind from inside our own brains. He likens this to an internal movie or internal theatre, but better because it includes all the senses. He adds that a computer can barely recognise a joke good or bad and when it can then we shall begin to know how the mind works.

Although he would probably not agree, one could continue his metaphor of the sensation of the internal movie or theatre in the brain by adding the necessity for direction of the play from the inside and the importance of rehearsal in our heads ready for the real thing. The significance of this duality and ambiguity, being able to hold two ideas together at the one time, has been identified as a key cognitive ability by several other neuroscientists. This quality is ironically, given Chalmers' jibe about the joke, a necessary one not only to understand jokes but also irony!

Can we and should we strive to promote the creative qualities so far identified in the brain's processes in learning and teaching? Would it matter and how would we know? Is creativity particularly related to such brain operation or learning?

2.3 Creativity and learning summarised.

In conclusion, from within those areas of particular interest to neuroscientists and cognitive psychologists, namely, how the brain functions, the role of emotion and rationality and neuronal connectivity, we find some shared implications for creativity and learning.

The characteristics enlarge on those already discussed: the integrated processes of the brain, the importance of brain plasticity, the significance of neuronal connections shaped by experience and arranged in assemblies, the effect of emotion and the body, the manipulation of images and the use of language.

Ten years ago, Bruer could write, 'Educational applications of brain science may come eventually but as of now neuroscience has little to offer teachers in terms of informing classroom practice' (Bruer 1997, p. 4). Nowadays, we can fairly say that neuroscience does illuminate the process of learning and education in the following ways:

- Neuronal connections tend to be stronger and more numerous, their assemblies more durable, when the learner is consciously and intentionally engaged in the activity.
- In some cases the intention and purpose and therefore the neuronal connections are further strengthened by high levels of intrinsic interest or engagement in the activity.
- Imaging and "as if" scenarios have a strengthening effect on neuronal connections as actual performance of the activity imagined.
- Consciousness and learning always entail some sort of emotion.
- Language, in the broad sense of symbolic systems, is a necessary medium or tool for conscious awareness, action and reflection, and therefore for creative learning and teaching.
- Some neuroscience now shows how the linguistic processing necessary for creativity occurs in the brain.

What they have in common, as did the examples in the creativity literature, is the quality of transformation. However, we still need to examine whether in practice this is the case, how we can tell, and whether certain methodologies promote improved learning and creativity in schools and class rooms.

Central to this exploration will be a much greater consideration of the role of language in Chapter 3.

2.4 Teaching Creatively

There are a number of recurring attributes in terms of teaching and learning in the literature discussed above.

They include the cognitive process of acquiring skill or knowledge; the crucial part that experience plays; the increase in the capability for effective action; the process which develops or changes the behaviour of the learner to a degree of permanence.

Embracing the main elements of such characteristics, learning may be broadly defined as a cognitive process affected by experience which enables an individual to know, understand, behave or be capable of doing something which they were previously unable to do.

Such a definition need not exclude facts and procedures requiring to be memorised, (such as times tables, vocabulary and syntax in a non native language, quotations, formulae and so on). Such rote learning is not done by absorption; the brain has to be active during the process but it is different from learning from experience and adapting to, or transforming, the environment or ideas. Rote learning and memorising are, rather, necessary accompaniments to many aspects of learning.

Memorising and knowing things by rote might well be part of the preparation stage of creativity described by Wallas when, to immerse ourselves in the problem or issue, we gather facts and information. What is really important in learning and teaching is that such rote learning not be the be all and end all. It is the next transformative and creative stage that develops the mind and is so personally satisfying and socially contributive for learners; the part which equates with incubation, illumination and outcome.

This differentiation is encapsulated in one of Caine and Caine's twelve learning principles which frequently form a significant part of teacher education in Australia and the United States of America:

Learning that is reducible to true-and-false is different from learning that engages actor-centered adaptive decision making. It is the search for meaning that organizes actor-

centered questions and encourages the use of higher order functions (Caine & Caine 1994, principle 3).

In creative teaching and learning one would expect to see some or all of the characteristics referred to so far in relation to both creativity and learning, and possibly other qualities associated with them.

2.4.1 Promoting creative learning

What is needed to promote creative learning? Firstly, for students to be creative across all areas of learning there has to be opportunity at all ages and in suitable environments. Creative learning is generally accepted in the arts, pre-school and junior classes, and possibly the humanities. However, it is not usually found in the sciences and mathematics, whose practitioners have been known to refer to it as ‘Mickey Mouse’ or ‘lacking in rigour’ or ‘delivering low standards’.

This need not be the case as we shall see later when considering methodology and looking at authentic examples of creative learning in science and mathematics. This derogatory attitude towards creative learning is particularly ironic given the nature and history of the scientific method, one of analysing, testing, hypothesising and verifying which fit so neatly into Wallas’s four stages as well as the repeated references to creativity by scientists and mathematicians cited in Chapter 1.

It is mistaken to think that skills, knowledge, control and understanding are absent in creative learning. On the contrary: a creative approach to teaching should improve academic results, not detract from them (NACCCE Report 1999, 28 p. 15).

Secondly, the relationship between teachers and learners, and the relationships that also develop between learners, important in all learning, are particularly necessary and rewarding in creative work which either has to be cooperative and collaborative, if it is a group creation or sensitive and trusting if it is individual and teacher.

Thirdly, there will be scant creativity unless there is confidence in the participants. Lack of confidence can prevent an attempt even being made or detract from the quality

of the attempt if it is made. Confidence is built by the teacher but sustained by and between the learners.

Lastly, the task and learning need to be challenging, even arduous, with the opportunity to self correct and succeed. There needs to be time, energy, and passion from students and teachers. The product must be real, not a test or a teacher exercise. There will be a range of cognitive, emotional and social processes occurring throughout the task. These include: genuine exploration and experimentation; freedom to enquire, question, and express thoughts and ideas; the development of possibilities, taking risks and feeling stress but in a supportive environment; the transformation of elements for the creative purpose; rigorous and committed preparation; critical evaluation and reflection on the process and the product; the opportunity to work individually and in groups; emotional involvement from empathy to humour and joy, and respect for each other and the creation.

Some of these processes, the creating, connecting and transforming ones, are marvelously portrayed in the following lines from Robert Harris's novel "Imperium", the life of Roman lawyer and orator Cicero. The passage describes the way in which Cicero creates and prepares for a vitally important legal and political argument in the public forum of Rome. His task needs courage; it is risk taking in the extreme, given the strong opposition to what he has to say, and it is before a huge and powerful audience. It is certainly for real. This is the pressure that drives him. The emotions also compare strongly with that of students in the same situation in learning:

While the world sleeps, the orator paces around by lamplight, wondering what madness ever brought him to this occupation in the first place. Arguments are prepared and discarded. Versions of openings and middle sections and perorations lie in drifts across the floor. The exhausted mind ceases to have any coherent grip upon the purpose of the enterprise, so that often – usually an hour or two after midnight – there comes a point where failing to turn up, feigning illness and hiding at home seem the only realistic options. And then somehow, under pressure of panic, just as humiliation beckons, the parts cohere, and there it is: a speech. A second rate orator now retires gratefully to bed. A Cicero stays up and commits it to memory.

Having prepared himself thus, it is through cooperation and team work in setting up his arrival and audience in the forum that finally make for perfection. Quintus, part of his team, has been asked to prepare him a crowd:

As if sensing their part in this fantastic pageant the crowd gradually swelled in number, so that by the time we reached the temple of Castor there must have been two or three hundred to clap him vigorously into court (Harris 2006, pp. 111-112).

2.4.2 The teacher's role.

The teacher's role in creative learning is accordingly complex. While some of the required attributes are considered below, the teaching methodology, with a variety of examples across ages and areas of learning, will be demonstrated later.

The prime attribute of the creative teacher is an understanding of the importance and nature of creativity in the learning process. Without this, there is no intention to teach in a creative way. It is much easier, in terms of preparation, and energy expended on the job, not to teach creatively. A course where prepared notes or worksheets are provided to students followed by a test is much less demanding.

The next step is to develop and demonstrate attributes which will bring about those characteristics of creative learning already described, namely, confidence, appropriate relationships, opportunity and suitable environments, and a variety of cognitive, social and emotional processes needed for the creative product.

Few of these characteristics of creative learning are possible without long term relationships and trust between the learners themselves and between the learners and the teacher. One destructive participant, joining the group as an antagonistic person, can threaten the bonds built through mutual trust, support and success over a period of time. Equally, a transient or temporary teacher will have to build a relationship over a period of time prior to creative learning becoming effective.

Since education systems cannot be changed overnight, the teacher has to fit the creative process and product into the system. It is usually the teacher who creates the

opportunity. For instance, homework, marking and examinations are firmly ensconced in traditional schooling. Narrowly interpreted these can get in the way of creative learning. The creative teacher can make thinking, finding out or watching a televised product a “homework” task which is “marked” by class discussion the next day; “examination” can be the performance or presentation at the end of the creative, learning period. The teacher also finds ways to make time become more flexible. Time and pacing are important when trying to match school learning with optimal individual and group learning and creating. Neither people nor their brains operate naturally on externally imposed deadlines.

The learning environment is significant in creativity and again it will be largely the teacher who arranges this. Perhaps most importantly, the environment inside the institutional space has to be made not just user friendly but owned, safe, isolated and appropriate. The feel within the space has to be trusting, supportive and exciting: a place where risks can be taken. The physical space is crucially important because it helps to shape appropriate learning qualities and activities.

What teacher attributes are required to generate the variety of cognitive, social and emotional processes needed for the creative product? The NACCCE report divides creative teaching in two ways: first, teaching creatively, and second, teaching for creativity. For the first, they suggest teachers use imaginative approaches to make learning more interesting, exciting and effective. They state that teachers cannot develop the creative abilities of their pupils if their own creative abilities are suppressed. For the second they believe it is possible to identify some general principles. There are three related tasks in teaching for creativity: encouraging, identifying and fostering.

These three are described in some detail and clearly relate to the qualities of creative learning listed above. They say, ‘the first task in teaching for creativity in any field is to encourage young people to believe in their creative potential, to engage their sense of possibility and to give them the confidence to try’ (NACCCE Report 1999, 28 pp. 17-19).

2.4.3 A social activity

The social and cooperative nature of creativity and the effect of group learning is emphasised by creativity experts and creators. For example, Andreasen is of the view that most creativity and creative learning happens in cooperative, collaborative groups. She notes the constant interplay and refining and redefining of participants' thought as they process what they hear in relation to what they think and what they then say which also becomes part of the group mix. Interestingly, she goes on to question whether such a group process affects the thought processes of those who work individually:

What is interesting is whether or not even those individuals who appear to work alone actually have internal dialogues with others or with the ideas themselves and whether or not this is enhanced by group experience (Andreasen 2006).

Andreasen also refers here to the role of language and thought which will be separately explored in some detail in later chapters.

Another strong emphasis on the importance of the group creative collaboration is noted by Catherine Murphy in relation to adult non-school learners involved in a health community arts project. Quoting from a participant in the project she says:

The process of making art is critical because that's the connection, that's where the meaning is made, that's where people do so much growing. Then at the end of it to see what you or what a group has created is a validation of the whole process (Murphy 2005, p. 48).

Drama and musical productions in schools frequently share these characteristics. The leap forward in understanding, learning and success appear to relate to the cooperative product and the courage to take a risk. They transform the activity and transcend school. Students' desire to continue learning in this way often lasts for years as the numbers choosing this subject testify as well as the memories which are recalled years later. Many also tend to stay involved in performance as continuing practitioners and audience members in their communities in adult life.

2.4.4 Obstacles.

It is worth noting the difficulties currently placed in the way of creative teaching and learning in schools. The NACCCE Report's comments in 1999 were prophetic:

Teachers in schools are increasingly required to teach to the test and have little room for dialogue, debate and creative work with students. If the creative potential of student teachers is ignored, it is unlikely that they will be able to promote the creative and cultural development of pupils (NACCCE Report 1999, p. 283).

As the committee anticipated (NACCCE Report 1999, p. 173) this has now become a matter of concern in Britain and, as it feared, the lives and learning of the next generation have indeed been adversely affected in serious ways by a narrow view of learning as assessable by standardised testing.

A recently published study, the "Cambridge Primary Review: Children, their World, their Education" (2009), attempts to detail how this has occurred. Edited by Professor Robin Alexander of Cambridge University, it is critical of the impact of government policies on an entire generation of children.

After six years of research and surveys, the report asserts that comprehensive education exists in name only. Britain's school system is now ranked one of the worst in terms of achievement. On educational attainment, Britain ranked 17 out of the 21 most advanced nations. Its children are the most tested, stressed and socially deprived amongst the advanced capitalist nations (UNICEF 2007).

The report is of the view that too much emphasis is being placed on the three R's imposing a curriculum on primary schools which is even narrower than that of elementary schools in the Victorian era. The report argues that memorisation and recall have come to be valued more than understanding, and enquiry and transmission of information more than the pursuit of knowledge in its fullest sense. It calls for the scrapping of testing seven and eleven year olds and the national league tables based on the results. League tables ensure that schools in areas of high social disadvantage

struggle to attract pupils and face closure or a massive reduction in funds, as funding is pegged to the number of pupils enrolled.

Teachers, it argues, have become alienated from the educational system. They are subject to a degree of government surveillance and accountability without parallel in most other countries. This is not fertile ground for creative teaching and the report notes:

Creative activities, the decline of which concerned many witnesses to the Review, raise the quality and capacity of children's thinking, perseverance and problem solving abilities, as well as fuelling their imaginations. Children are very competent and capable learners – given the right linguistic and social environment (CPR 2009, p. 12).

It is interesting that the biggest shift advocated by the report is to the primacy of talking and writing. It declares, 'Avoid pedagogical fads and fashions and act instead on those aspects of learning and teaching, notably spoken language, where research evidence converges' (CPR 2009, p. 7).

A replication of this in Australia would clearly be a barrier to creative teaching in the same way. The prescription of process, texts and publicly competitive school results would create far greater obstacles than any which currently exist, see Appendix (9).

2.4.5 Importance.

Andreasen, similarly concerned for the future, says, 'I think one of the most important questions that we have to think about as a society, that is a human society linked throughout the world, is how can we help our young children be more creative?' (Andreasen 2006).

Greenfield shares these views but adds the dimensions of political fundamentalism and received electronic information as possible totalitarian influences requiring an individual response:

My own view is that the answer is to foster creativity. When you're being creative you have a very strong sense of self, of being different, of doing something or seeing something that no one else has thought of.

We have a few people who are being creative. But we live in a society where some people are defining themselves by a collective cause and other people are glassing out in front of a computer (Greenfield 2005).

Greenfield's point in the second sentence of this quotation is a very significant one in support of creativity in education. It refers to the important power of originality. Her call here for creativity to forestall the situation she envisages may arise from the critical faculty which creativity often includes. It is unusual for someone to create something without the ability then to be critical of another similar creation. For instance, having created an advertisement at school, students are much more likely to be critical of a commercial one. They know it from inside; they are aware of the techniques used for persuasion. Creativity also leads to the consideration of alternatives and contradictions. This kind of thinking is unlikely to produce the mind of a gullible or prejudiced person who could be overtaken by a fundamentalist paradigm or view a computer passively.

Given the present and future importance of creativity in education it is not surprising that NACCCE included the practical step of funding and supporting creative methodology in graduate and undergraduate teacher education courses (NACCCE 1999, Report 174 Recommendation 10) and the CPR recommends an end to "fast-track" teacher training in favour of aligning teacher education with the review's aims, curriculum and approaches to pedagogy (CPR 2009, p. 8).

2.5 Creativity, learning and teaching summarised.

In the consideration of creativity in Chapter 1, the central claim that creativity makes something original or new for a purpose was shared both in the research and by creators.

The additional characteristics of the creator were wide ranging. They included intention, commitment, imagination, intuition, inspiration, purpose, emotion, humour, confidence and making meaning.

The creative developmental processes incorporated imitation, making associations and analogies, divergent thinking, problem finding and solving, risk taking, synthesis, analysis and practicality, specific domain-knowledge, cooperation, the combination of disparate elements and their transformation; a process of preparation, incubation, illumination and execution and a product.

In Chapter 2, in the literature on creativity in learning we have noted that some of the same and similar characteristics occurred regularly. They include quantitative creativity, conditions and environments, incubation, intuition and the unconscious, motivation, intention and engagement, the brain and making meaning, emotions, transformation, brainstorming, convergent and divergent thinking choice and discovery, curiosity and problem solving.

In terms of creative learning, neuroscientists and cognitive psychologists refer to the integrated processes of the brain, the importance of brain plasticity, the significance of neuronal connections shaped by experience and arranged in assemblies, the effect of emotion and the body, the manipulation of images and the use of language.

The attributes of the creative teacher are ones which complement, support and promote many of the creative qualities listed.

Are any or all of these qualities from creators, creativity theorists and neuroscientists present during a variety of school learning experiences? Are they evident in the teacher's role, the nature of the activity and the promotion of learning? If they are, do they enhance the learning? Is it possible to composite or reduce them in a way which would be representative but also practicable for research purposes?

At present these questions are largely unanswered. What is missing is the direct connection between learning and the process of creativity. Through applied research we need to demonstrate that active not passive learning, described as transformative or double-loop learning, can happen in a creative classroom. Such evidence would also provide useful, relevant and complementary findings to add to our current knowledge of creativity and learning

However, there remains one more important component in creativity and learning to be considered. The role of language, in particular, will be considered in the next chapter.

PART 1

CHAPTER 3

CREATIVITY AND LANGUAGE

3.1 The role of language in creativity and learning

My initial assumption was that just as creativity is transformative so is learning and, furthermore, the brain itself is a creative and transforming organ. The vehicle for this transformation is our power to symbolise meaning and to represent the world to ourselves. The symbols may be sounds or signs which denote meaning: images, numbers, notations or words, written or spoken.

The following quotation from Philip Hensher's novel "The Northern Clemency" catches remarkably the indecipherability of word and number in mathematics before we have learned what they signify:

The fourth years had been in the classroom before them, and on the board was an abandoned, impatient tangle of x and y, the obscure and useless corners of the alphabet, mixed incredibly with numbers, some normal sized, some shrunk and sent to the top of a letter like a scratch on the forehead, symbols poetically abstruse and, for the moment, as blank as the hieroglyphs of a kingdom disinterred from the sand; a frail language occasionally glimpsed about the school that it seemed impossible he, or any of them, should ever comprehend or, like French, converse in and, looking at it, he brought a measure of wilful ignorance even of those fragments he could have understood (Hensher 2009, p. 172).

As Damasio has argued, and creators have acknowledged, the symbolic representation of meaning is often an interweaving of imagery, notation and word. Greenfield (2001, p. 71) says 'the quintessence of language is the manipulation of symbols in a whole variety of flexible and changeable ways'.

Language, however, is the predominant, though not exclusive, means whereby we are able to think, learn and create. It predominates because of its relationship to thought. As such it allows us to evoke, manipulate and organises images and experience and to

reflect. These are processes not only of learning but also of creativity. This is succinctly expressed by Torey:

Every creative act, be it the architect's vision of a building, the film-maker's projection of a screenplay, the novelist's visualisation of a story or the engineer's mental solution of technical problems, uses this language-driven combinatorial method to come up with the goods (Torey 2003, letter to the author, 7 August).

For Chomsky, language 'makes infinite use of finite means' (Humboldt 1836, cited in Chomsky 1965, p. v).

One of the most widely noted examples of the latter (generativity) is our undeniably flexible use of language through which we craft an infinite variety of novel constructions using a relatively small set of rules (Chomsky 1972, Pinker 1984 cited in Ward et al. 1999, p. 190).

These quotations underscore the main reason for devoting a whole chapter to language. It is through language and thought that learning and creating patently happen; it is through language that we know what has been learned or created. In addition, in my experience, a focus on the pivotal role of language in learning has gradually ebbed in priority over the last decade in teacher pre-service education and teacher professional development.

Despite extensive references by neuroscientists to the ability to think, know, feel and call up images, with the exception of Torey (1999), there is relatively little detail on the role that language plays in this process. I can only think that its importance is assumed.

For instance, the following statement is made by Susan Greenfield but without extension or further explanation, '... it is by virtue of language that humans can soar above the rest of the animal kingdom in problem solving, hypothesis formation, and more general thinking' (Greenfield 2001, p. 72).

Daniel Dennett acknowledges the role of language which he believes makes us the most intelligent animals on earth, 'These other species do climb a few steps up the mountain

on whose summit we reside, thanks to language' (Dennett 1994, p. 1). He also chooses not to elaborate but refers us to the work of linguists and psychologists for further exposition.

Damasio is rather more explicit about the role of language, and acknowledges thought as "inner speech" but considers images as having prime importance:

Thought is made largely of images ... held in consciousness only fleetingly and although they appear to be good replicas they are often inaccurate or incomplete (Damasio 2006, p. 100).

... nobody will deny that thought includes words and arbitrary symbols ... both words and symbols are based on topographically organised representations and can become images. Most of the words we use in our inner speech before speaking or writing a sentence exist as auditory or visual images in our consciousness. If they did not become images, however fleetingly, they would not be anything we could know (Damasio 2006, p. 106).

He says further that images are not stored as facsimile pictures of things, or events, or words, or sentences. When we recall a given object or face or scene, we do not get an exact reproduction but rather an interpretation, a newly constructed version of the original.

While these observations are extremely helpful in understanding the process of recall so necessary in ongoing thought, there is no mention of any role played by language in the evocation, manipulation or organisation of these images all of which are required for creativity.

Damasio's emphasis is on images, with words to assist, whereas Torey has words as the prime vehicle for thought and imaging:

Anything we think (rather than just vaguely visualise) must be in the word percept form. Without speech–thought there could be no inward penetration and self perception of any kind. The brain could neither construct the self nor think about it. Having

speech-thought the brain is able to reflect upon itself and function as the co-creative source of its own experience (Torey 1999, p. 134).

Inward penetration, self perception and reflection are obviously creative qualities allowing for metacognition and the interpretation of experience. Torey also agrees that the brain is a “transformer” that shapes and combines all manner of bits and pieces of percepts, concepts, images and impressions:

The brain’s generativity is made possible by the categorical items (the word percepts) and by the “off line” language facility with which these can be organised and conveyed. The brain can now combine, recombine and invent. ... it has unlimited scope to mould its mental contents in new ways, to ask questions, to formulate answers and to test for the goodness of fit (Torey 1999, p. 25).

He further believes that without the language mechanism nothing new could materialise and creativity would be impossible:

‘... language is in fact the conduit for creativity, just as it is the key to our reflective self-awareness, the self-experience our new processing routine continuously generates (Torey 2007, letter to the author, 4 April).

Apart from neuroscientist Torey, it is experts in other fields, educators and practitioners, linguists, philosophers, psychologists and sociologists who provide not conflicting, but fuller, descriptions and understanding of the role of language in learning and creating.

3.1.1 General characteristics

Language has been described in similar ways by linguists, psychologists, sociologists and other thinkers during the last century. The brief observations which follow are derived from an extensive sociological and educational field, in particular the work of Britton (1972), Dixon (1974), Sapir (1961), Vygotsky (1962), Luria (1975), Bruner (1963) and Berger and Luckmann (1967).

Nearly all of these views arose out of the observation and experience of educational and language development, the comparison of identical twins, the study of people with brain

injury, or animals. Most were developed before the disciplines of neuroscience and current scientific tools to study the brain such as recording neuronal activity, studying voltage and magnetic charges using electro and magneto encephalograms, measuring blood flow in the brain with positron emission tomography and, perhaps best known, magnetic resonance imaging.

While their conclusions and observations are not inconsistent with what neuroscience has been able to tell us so far, their substantial difference is to place thought and language at centre stage of human consciousness, learning and creativity. Their shared views include the idea that the most significant characteristic of human beings, which separates them from animals, is their use of language and that its essential quality is the power to symbolise; that we can represent the world to ourselves; that language allows us to perceive, organise and categorise our experience and form concepts; it allows us a past, present and future; language and thought are interdependent; we can communicate to ourselves and to other people; external communication is not separate from internal, and as we speak with others our own speech and thought is affected in an ongoing and interactive way.

There is common agreement too that language incorporates the experience of generations and more broadly humanity and is capable of becoming the objective repository of vast accumulations of meaning and experience which it can preserve in time and transmit to following generations through writing and reading the symbolic representations. Writing is a further symbolising of language, at one remove from talk, more permanent, more deliberate and more edited. Writing also has an interactive relationship with language and thought, as has reading. Symbolic representations, whether spoken, read or written word; painted, sculpted or electronically produced image; number or musical notation can all be creative, discretely or together.

These writers and their views were commonly part of teacher training in the 1960s and 70s. Many teachers, myself included, have been guided in our practice of education by aphorisms such as ‘How can I know what I think until I see what I say?’ (Wallas 1926, p. 106); Vygotsky quoting from the Russian poem by Osip Mandelstam, ‘I have forgotten the word I intended to say, and my thought, unembodied, returns to the realm of shadows’ (Vygotsky 1986, p. 210); Wittgenstein’s ‘The limit of my language means

the limit of my world' (Wittgenstein 2007, p. 51); 'I forget what I was taught; I only remember what I have learnt' (White 1966, p. 51).

In more recent years Stephen Pinker, experimental psychologist, cognitive scientist and expert in linguistics, has produced highly influential work on brain and language. He has popularised the profound and significant idea from the work of Noam Chomsky that humans are born with the innate capacity for language (Pinker 1994).

He also agrees with the view already referred to that language derives infinite capacity from finite means. Pinker supports too the concept developed by Chomsky of generative and universal grammar. While universal grammar does not seem immediately pertinent to language and learning in the classroom, the notion of generative grammar contains within it the act of transforming and creating which is certainly supportive of what is being argued here. Language and learning are dynamic not static. They are not prescribed to be somehow passed on to the next generation.

He has further promoted other views which fit the thesis that language is developmental both individually and historically and therefore part of education and learning.

For Pinker natural selection and evolution (evolutionary psychology) are responsible for the development of language and interestingly he notes that abstract language is frequently based on concrete metaphor often derived from our past. This use of concrete experience and imagery to understand something new or abstract is frequently a feature of new learning amongst students, as can be seen in the transcripts analysed in Chapter 6. This is a specific example of the interweaving of word, image and thought so often found in creativity.

It has already been suggested that it is through language that we can best understand what a person is thinking and understanding and Pinker agrees that language is the most accessible part of the mind.

Like Vygotsky, Pinker believes thought and language are different. Vygotsky refers to the language of thought as abbreviated, highly condensed, individualised and expressing pure meaning; Pinker calls such thought language "mentalese".

There is a difference between Pinker and Vygotsky, though, in respect of the importance of adult talk to the development of language in babies and infants. He says that the baby is equipped with skills, but that they are not learned by listening to parents.

Vygotsky and others would argue that while the potential for language is innate in humans, the social nature of language is of prime importance as well in the post natal early years. The discovery of babies nurtured by wolves or otherwise isolated from human contact in their early years is largely controversial but has one thing in common: they are all found to be without language when discovered (Sleeman 1888, p. 87-88). Torey (1999, p. 55) argues that the social period for language development once missed is irretrievable.

There is also another significant view of the role of language which is at odds with the views of other experts quoted and referred to in this chapter. It is an important one given the role of language in education. Pinker disagrees with the claim that thought depends strongly on language and rejects the Sapir-Whorf (1961) hypothesis that language influences a person's possible range of thinking.

He believes rather that language conveys thought but does not shape it; that language is a window on to thought. Referring to the language "Newspeak" coined by Orwell in his novel "1984", he argues that thought can occur without language; there may have been no word for "freedom" in "Newspeak" but it could still be contemplated in a person's mind. He states, 'Concepts of freedom and equality will be thinkable even if they are nameless' (Pinker 1994, p. 73).

One could reply that Winston Smith, the book's protagonist, had been alive and educated in a time when a rich English language existed and was to be found in books. He had already acquired the concept of freedom before "Newspeak" was established; others born in the era of only "Newspeak" would not have had the ability to form linguistic abstractions. This is surely the point Orwell is making. Without articulated and abstract forms of speech human thinking can be reduced to a non-questioning acceptance of authoritarian rule.

This is obviously a serious difference of view given that education broadly, and this thesis in particular, rests on the assumption that our thinking grows ever more complex the more we are open to spoken and written language and use it for ourselves in diverse ways, often with others, in order to communicate or accomplish something.

The enormous difference that language makes is movingly described by Jane Goodall in relation to chimpanzees. As well as lamenting their lack of language and consequent inability to express wonder in words, her own language in describing this experience serves to make the point even more strongly:

Yes. Well the sense of awe is very obvious, particularly we have some amazing waterfalls with an 80-foot drop and they've carved a groove for themselves over the thousands and thousands of years, so that as the water drops down through this narrow chasm, the air is displaced; there's always spray and there's a thundering sound and the ferns are waving. It's a very spiritual place. Sometimes when the chimpanzees get there, you see their hair become erect and they arrive and they start this - it's like a dance. They go upright and they sway from foot to foot, and then sometimes, at the end, sit on a rock and you can see their eyes following this water. You know, what is it? It's always coming, it's always going and it's always here. You just feel that if they had our sophisticated spoken language, and that's what I believe differentiates us most, that after this, they could then discuss, which is something we can do and they can't, what this feeling was, and that this could turn to some kind of primitive animistic religion, you know the worship of the water and the stars and the moon. It seems to me that this dance must be provoked by the same kind of wonder and awe that we feel with these manifestations of the wonder of nature (Goodall 2006, p. 4).

3.1.2 Speech in humans.

Sounds are produced in the larynx, the hollow chamber or voice box located just above the wind pipe. Unlike nonhuman primates and all other nonhuman animals and birds, it is positioned low, enabling it to make a full range of non nasal sounds. Vibration of the vocal cords by air passing out of the lungs causes the formation of sounds that are amplified by the resonating nature of the voice box. The larynx acts as a complex valve for exhaled air to come out in puffs so providing the energy for speech shaped by the lips, tongue and hard and soft palates.

The monumental difference between human language and avian vocalisations, animal sounds or the conditioned responses of intelligent mammals is that humans use sound to create and manipulate symbols in myriad ways.

The explanation for this lies in the unique wiring of the human brain. The left temporal or vocal bulge is a feature that only humans (in Broca's area), the songbird and the chimpanzee possess. In the songbird the structure seems only to subserve audio motor specialisation for sound pattern recognition and reproduction without higher order mental operations. In the chimpanzee the structure is insufficiently wired in with other cortical functions to create the high grade interactions that form the neural basis of speech in humans.

Another key feature is the early development of this language facility in the human child. Babies' brains appear to be geared up to learn and understand language from birth or even in utero. By the age of two most children are beginning to learn to speak and by six knowledge of the whole sound system of the child's native language – its phonology, grammar and a great deal of the meaning that language encodes - is more or less complete. There are various abstract rules inherent in every spoken language and each of these is learned by listening to it and speaking it.

Given the brain's continued plasticity, the ability to acquire new vocabulary, other languages and increasingly complex language continues throughout life. Vygotsky concluded that after the acquisition of language, differences in intellectual development depend on social and cultural experience:

Thought development is determined by language, i.e., by the linguistic tools of thought and by the sociocultural experience of the child.

The child's intellectual growth is contingent on his mastering the social means of thought, that is, language (Vygotsky 1962, p. 51).

The acquisition of language is a social activity. Since, it is argued, it is a latent potentiality that is facilitated by neoteny regression (the tendency in a species to

exhibit increasingly incomplete structures and organisations at birth, allowing for postnatal neural growth to wire up the system), it needs to be fostered to become effective. Without exposure to language the potential stays dormant, the left hemisphere remains committed to manipulo-spatiality and the opportunity is lost.

It may seem irrelevant to examine the growth of speech (symbolising meaning in words) in babies and the very young but it is a monumental occurrence in relation to human development, culture and creativity which has diminished currency in education.

3.1.3 Speech and thought.

The linking of speech and thought was an important innovation in the 1920s by Lev Semenovich Vygotsky. His works were published after his death in 1934, suppressed in 1936 and were not known in the West until 1958. It was the lynch pin of educational research into language, learning and educational practice by the authors listed at the beginning of this chapter. Even some forty years later, Damasio also refers to “inner speech” an important new concept identified by Vygotsky. It is also a brain process characterised at the immersion stage of creativity before illumination, when the meaning is not yet expressed in words but as “inner speech” often accompanied too by fleeting and contorting images as described by Einstein.

The process according to Vygotsky is that language starts as a tool external to the child used for social interaction. As children grow into their second year, they use this tool to guide their own activities in a kind of self-talk or "thinking out loud". Initially, self-talk is still very much a tool of social interaction, tapering away to negligible levels when children are alone. Gradually, however, self-talk is used more as a tool for self-directed and self-regulating behaviour. Around the time children start school, their self-talk seldom happens, not because it has disappeared but because that kind of speaking has been internalised. Young children move from thinking out loud to thinking silently. External speech is the process of turning thought into words; its materialisation and objectification. Inner speech is the opposite; it is the conversion of speech into inward thought. Inner speech develops through its differentiation from social speech. Inner speech is speech for oneself; external speech is for others.

There is a strong connection between thought, language and creativity. Creative acts begin and proceed through thought, usually as images combined with or manipulated by words until they are at last manifested in symbol. The symbols may be sounds or signs denoting meaning, in the forms of images, numbers, notations or words. They can be written or spoken. The creations are myriad: a new poem, tool, symphony, painting or construction. All that can be devised with originality and for a purpose relies on this integration of thought, language and meaning

The structural characteristics of the two kinds of speech are different given their opposite functions. The internalised speech is unintelligible to anyone except the thinker, being compressed and made up of only predicates. Words too are used much more economically. One word in inner speech may be so replete with sense to the individual that it would take many words to express it in external speech.

These characteristics of inner speech are expertly described in a modern novel “Saturday” by Ian McEwan:

Is he so frightened that he can't face the fact? The assertions and the questions don't spell themselves out. He experiences them more as a mental shrug followed by an interrogative pulse. This is the pre-verbal language that linguists call *mentalese*. Hardly a language, more a matrix of shifting patterns, consolidating and compressing meaning in fractions of a second and blending it inseparably with its distinctive emotional hue, which itself is rather like a colour. A sickly yellow. Even with a poet's gift of compression, it could take hundreds of words and many minutes to describe (McEwan 2006, p. 81).

A simplified syntax, condensation, and a greatly reduced number of words characterise the tendency to predication which appears in external speech when the partners know what is going on. Abbreviations and agglutinations also occur. A tape recording of a child's pre-sleep monologue recorded by a student at the University of London's Institute of Education did indeed show these characteristics of compression, personal context and few subjects or pronouns. The decreasing vocalisation of egocentric speech denotes a developing abstraction from sound, the child's new faculty to “think words”

instead of pronouncing them. Inner speech is to a large extent thinking in pure meanings.

This is not to say that thinking cannot take place without language, but rather that it is mediated by it:

The leading idea in the following discussion can be reduced to this formula: The relation of thought to word is not a thing but a process, a continual movement back and forth from thought to word and from word to thought. In that process the relation of thought to word undergoes changes which themselves may be regarded as development in the functional sense. Thought is not merely expressed in words; it comes into existence through them. Every thought tends to connect something with something else, to establish a relationship between things. Every thought moves, grows and develops, fulfils a function, solves a problem. This flow of thought occurs as an inner movement through a series of planes (Vygotsky 1962, p. 125).

This description of thought parallels the “connections” referred to by Greenfield with the important difference that language is the vehicle. Making connections, particularly unusual ones, is frequently noted in creativity too.

Developmentally this process goes on to reach a much higher level of sophistication. Vygotsky says that each word is already a generalisation. Generalisation is a verbal act of thought and reflects reality quite differently from the way in which sensation and perception reflect it. However, generalised concepts come only with maturity at the advanced stage in the development of word meanings:

Thus, true human communication presupposes a generalising attitude, which is an advanced stage in the development of word meanings. The higher forms of human intercourse are possible only because man’s thought reflects conceptualised actuality. That is why certain thoughts cannot be communicated to children even if they are familiar with the necessary words. The adequately generalised concept that alone ensures full understanding may still be lacking. Tolstoy, in his educational writings, says that children often have difficulty in learning a new word not because of its sound but because of the concept to which the word refers. There is a word available nearly always when the concept has matured (Vygotsky 1962, p. 7).

The ability to generalise using abstract categories or concepts has again been frequently referred to by other authors as a necessary component of intellectual maturity, higher order thinking and often a characteristic of highly creative thinkers. Again the difference here is that language is essential.

3.1.4 Speech in discussion.

I hear myself as I speak; my own subjective meanings are made objectively and continuously available to me and 'ipso facto' become more real to me (Berger & Luckmann 1967, p. 52).

If the very act of speech objectifies thought to one's self, it follows that a group of people discussing will have available to them the objectified meanings of themselves and their fellow participants, again especially important in creative learning where groups are often formed, 'In group discussion the spoken contribution of each member may be worked upon by speaker and listeners alike and in the immediacy of face-to face speech they make corporate enquiry a powerful mode of learning' (Bullock 1975, 4/8).

Paulo Freire expands this observation, 'To name one's experience is to read the world. Language is the transformative agency therefore language is the foundation for cultural action for freedom' (Freire/Giroux 1987, p. 7).

Discussion for a specific purpose can include questions and replies, problems and solutions, contradictions and agreements, interpretation of text and own experience. Freire adds the potential for criticism to this list, 'As they discuss the world of culture, they express their level of awareness of reality ... their discussion touches upon other aspects of reality which come to be perceived in an increasingly critical manner' (Freire 1972, p. 117).

All of these language processes create connections in the brain; call up imagery and expand and refine thought. They lead to greater knowledge, understanding and action. They also allow for additional data to be added to current concepts as well as the new formulation of an individual or group concept.

The teacher plays a role in these processes:

The quality of the discussion is not determined solely by the ability of the pupils. The nature of the task, their familiarity with the subject matter, their confidence in themselves, their sense of what is expected of them, all these affect the quality of the discussion, and these are all open to influence by the teacher (Barnes 1976, p. 71).

In Freire's theory and practice the teacher is also the learner; the activity breaks down the traditional barriers of teachers. Both gain insights – learner-teacher and teacher-learner, 'They assert their own voices while still being able to encourage students to affirm tell and retell their personal narratives by exercising their own voices' (Freire/Giroux 1987, pp. 23-24.).

The role of the teacher and the methods which best promote such discussion are analysed and demonstrated in my later chapters on methodology.

3.1.5 Reading and the written word.

After naturally learning a spoken language, how does a young child cope with the unnatural skill of reading and writing? To understand written words, children must appreciate that an object can be represented by certain sounds and these can be represented by lines on a surface. Both reading and writing are established most readily on a foundation of good spoken language (Blakemore and Frith 2005, p. 47). The fact that language is visible in print makes a huge difference to the ability to think and reason about it as an object of interest (Blakemore & Frith 2005, p. 42).

The inference which can be drawn here, and further elaborated below, is that while language shapes thought, written language further distances, fixes and objectifies it. This is pertinent to creative teaching and learning in that both process and product often include symbolic representations and written texts:

Written language demands conscious work because its relationship to inner speech is different from that of oral speech: the latter precedes inner speech and presupposes its existence (the act of writing implying a translation from inner speech)...The change from maximally compact inner speech to maximally detailed written speech requires

what might be called deliberate semantics – deliberate structuring of the web of meaning (Vygotsky 1962, pp. 99-100).

Halliday concurs with the emphasis on meaning in text:

What are the essential properties of text? It is meaning, and it is choice. In the first place text is meaning. We think of text first of all as words and sentences; and it is certainly encoded in words and sentences in just the same way as those words and sentences are further encoded in sounds, or in letters. But text is not made of sounds or letters and in the same way it is not made of words and phrases and clauses and sentences. It is made of meanings, and encoded in wordings, sounding and spellings. In other words, we are locating text at the semantic level ...

Secondly, text is choice. A text represents a selection within numerous sets of options ... We are referring to the total set of such semantic options as the 'meaning potential' ... text represents the actualization of this meaning potential (Halliday 1975, pp. 123-124).

The sentence frameworks within oral and written texts are also of significance. Torey describes how the syntactic frame, the sentence format, enables the brain to assemble, juxtapose and mould ideas, whether real or unreal and how this can be used with impunity for good and ill (Torey 1999, pp. 188-189).

Communication in writing relies on the formal meanings of words and requires a much greater number of words than oral speech to convey the same idea. It is addressed to an absent person, who rarely has in mind the same subject as the writer:

In learning to write, the child must disengage himself from the sensory aspect of speech and replace words by images of words. Speech that is merely imagined and that requires symbolisation of the sound image in written signs (a second degree of symbolisation) naturally must be as much harder than oral speech for the child as algebra is harder than arithmetic. Our studies show that it is the abstract quality of written language that is the main stumbling block, not the underdevelopment of small muscles or any other mechanical obstacles. (Vygotsky 1986, pp. 180-181).

The spoken word is transient as opposed to the permanence provided by the written word and art forms, allowing for the accumulation of knowledge and experience, 'Before writing, spoken language existed for tens of thousands of years. It does not leave a permanent record, writing does. Speech depends on memory; it is a transient mode of communication' (Blakemore & Frith. 2005, p. 68).

Thus poems, songs and rhymes have a dual role. They give us access to history and help us collectively to remember. This is replicated in microcosm in children's development:

Visible language creates a new world of objects, symbols, or letters, which have a lawful relationship to the sound of speech.

The mappings between symbols and speech have to be learned, and the learning has a lasting impact on the brain.

The brain of the literate person is different from that of the illiterate in appearance and function. Literate people just need to look at print to know what it says. What is more they decode it automatically, even if they have no intention of reading it (Blakemore & Frith 2005, p. 71).

The written word also has political power in that an inability to read closes avenues of understanding and knowledge presented in written form and not being able to write prevents any involvement or action within a literate culture. While this has been addressed in theory and practice most notably by the work of Paulo Freire, particularly his identification of the "culture of silence" (Freire 1970, p.34), Richard Flanagan in his novel "Waiting" makes this point from an Australian perspective through his description of the effect of the written word on the stolen Aboriginal child Mathinna:

Wearing shoes, she felt as if her body had been blindfolded.

But she wanted to write and Lady Jane said she could have pen and ink and paper only if she kept her shoes on. For the magic of written words had not escaped Mathinna. She had watched Sir John and Lady Jane pore over the scratchings, like so many plover tracks in the sand, that marked the boxes of bound paper they read. Large currents of

feeling passed through them. After, they would laugh or grimace or seem to be dreaming. She listened to the music of the scratchings when Lady Jane read poetry out loud, and saw the power of them to affect others when Sir John looked up from his silent reading of memoranda and ordered a lackey to act. Their meaning was large and often unexpected.

... she had seen seagull tracks in the sand, thinking perhaps Towterer was sending her some message. Lady Jane had laughed, and Mathinna realised that what was written in the world mattered not, but what was written on paper mattered immensely (Flanagan 2008, p. 120).

3.1.6 Narrative

Probably pre-eminent amongst the creative language structures used by human beings to make sense of their world, communicate it to others and themselves and feed into generalisations or concepts is the “story”.

The story has been a never ending phenomenon throughout human history; it is still the foundation of what most people pay to see and hear in their leisure; it is fundamental to most language exchanges whether momentous or trivial. When a young teacher at our school recently died in a car crash, the story had to be endlessly told, re-told, re-examined and felt by the community. Any teacher standing amongst children talking in groups before school begins hears not only the recent stories of everyday life being shared but also often expressed as a script with many ‘so he said’...and ‘she said’ ... and ‘he goes’ ... and ‘I go’ ... and so on. Sometimes they emanate from personal experience, sometimes from hearsay or last night’s television programmes.

Any teacher or student who tells a story in a lesson is guaranteed attention. Such stories have an easily identifiable shape and list of ingredients. They follow a sequence which leads to a definite end point, they have characters, dialogue, imagery and often humour. They frequently involve acting out parts of the narrative. There is no doubt that they are both concrete and visual but can also become part of the stuff that ideas, concepts and generalisations are made of. Such every day stories are creatively formed and often become material for further sophisticated narratives or other art forms.

D. Jean Clandinin and F. Michael Connelly in “Studies of Experience and Narrative Enquiry” (1990) say that humans are ‘story telling organisms’ who lead storied lives (individually and socially). They go on to say that the study of narrative is therefore the study of the ways humans experience the world and that education then is the construction and reconstruction of personal and social stories.

This interest in, and importance of, stories in classroom learning will be seen later as creation and analysis in science, drama and English discussion. From them it is my experience that we can, and do, arrive at generalisations which become the pegs on which to hang and make sense of (categorise) experience (stories) in order to learn. We also place a value and perspective on the stories not just listen. We change and reinterpret them. Clandinin and Connelly describe this process as a ‘Flux of stories continually transforming and being transformed’ (Clandinin & Connelly 1990, p. 9).

This description in many ways brings together most of the aspects of creativity, neuroscience and language so far discussed. The stories are communicated via the creative transformation of thought and language in the brain. The listeners then recreate the stories through the language and their thought. While all this is happening the participants each have before them the external image of the real talkers in a real place and the images and sounds of the story being told with different people and places. These are all seen, felt and understood by the brain at the same time.

Clandinin and Connelly also point out that, ‘Teachers and learners are story tellers and characters in their own and other stories’ (Clandinin & Connelly 1990, p. 9).

While there will be many of these demonstrated in the collected data, one example stands out. A trainee teacher sitting in the middle of a close circle lit with only green and red stage lights telling his story of abuse in a park shelter when he was a boy. All the participants were stunned as was the teacher who in telling the incident relived its emotion. The power of language and transformation to do this has been discussed previously. He said that he had never told anyone about it before. The situation was a drama lesson and the reason for the discussion was to try to flesh out and ‘peg’ violence and power in sexual offences for the purpose of the play and the further understanding

of the students. This example is also a demonstration of another observation by Clandinin and Connelly, 'Narrative enquiry is a process of collaboration, involving mutual story telling and restorying' (Clandinin & Connelly 1990, p. 9).

3.1.7 Cooperation, language and creativity.

In Chapter 1, creativity was discussed in relation to its various aspects and elements. It was clear that creativity is frequently individual and often regarded as such. We can reel off great creators of the past and present such as Shakespeare, Beethoven, Einstein or Hawking. It also became clear, however, that creativity not only emerged from a social situation but was shaped, affected and implemented with and by other people.

Creativity can and does occur individually. Freddy Mercury and John Deakin from the Rock music group "Queen" did agree that they wrote their own songs. However, for both, considerable group collaboration, discussion and practical work with others went on before and afterwards. They each listened to all kinds of bands, played all kinds of music, rehearsed and practised a variety of genres, performed with many different bands and had a shared, group concern with "musicianship". In both instances the individual ideas were also redefined and changed by the rest of the group later (Mercury 1975).

While social cooperation can plainly occur without language, it is immensely sophisticated by its use. Language galvanises cooperation and the language involved in the cooperating extends and enriches the learning.

Language also contributes to the immersion part of creativity where saturating yourself in the "domain" enables you to join the verbal, and symbolic, discourse of the subject area through talking "the talk" cooperatively with other practitioners. Without language you could not participate and learn in what Ken Robinson (2009, p.116) calls "your tribe". It enables the constant interplay and refining and redefining of participants' thought as they process what they hear in relation to what they think and what they then say which also becomes part of the group mix. It enables them to mentor, connect, support and create.

Torey's view that the neotenously regressed and neuroplastic brain of the human infant is able to develop its latent speech capability in the group setting and that without the group and the exposure to language, the child could not acquire either speech or internal communication (thought) has already been referred to. He also comments on the group context later in relation to the child:

As for the young, the group context is a veritable psycholinguistic humicrib – a prescriptive formula for shaping the identity and mentality of the child, who is therefore unwittingly and unconsciously constrained, nevertheless, the group context confers benefits upon the child. It allows it to partake in the manifold physical and mental advantages that the group's speech based life style guarantees (Torey 1999, p. 55).

And later in the life of the child, he comments:

Through language, the group is more than an ex-midwife of the infant speech process and more than a nutrient for the continuing speech practice. It creates a vaguely sensed experiential riddle in its own right, that of the self aware mind, in whose functional frame humans know they know, yet cannot fathom the way of their knowing (Torey 1999, pp. 58-59).

All of Freire's practice takes place in cooperating circles of learner/teachers and the outcome he seeks is also a collaborative one described as, 'Critical and creative participation in the process of reinventing their society' (Freire 1987, pp. 64-68).

In summary, in group discussion participants are led, through conversation, beyond their initial positions towards a consensus. There is integration of differing perspectives, not necessarily agreement; more differentiated and articulated than the separate views of participants and more developed than when they began. This process is evident in all preparations for creative activity and is by no means easy. The hermeneutics school has contributed much to our understanding of this issue.

3.2 The role of language in creativity and learning summarised.

The symbolic representation and creation of meaning is unique to human beings. Language is the means by which we communicate to others and ourselves in myriad

ways and read and write texts which are lasting records of communication. It is the vehicle through which we are able to cooperate with others to organise and produce in our world. Above all, it allows us to shape an idea, consider and communicate it to others. As such it is the 'sine qua non' in learning and creativity. It works with other areas of symbolic representation, those of image, number and notation expressed through sight and sound.

The aspects of creativity, learning, neuroscience and language discussed in the first three chapters have many characteristics in common. They are frequently inextricably linked. This can be seen happening at the school level in a piece of creative writing attached at Appendix (2).

In combination these aspects of creativity might form a powerful template for educational process in creative teaching. We have seen that theories and applications of creativity already exist but there is an absence of a pedagogy that emphasises the role of language in creative learning or draws on data derived from regular ongoing teaching.

It is to this need that this thesis seeks to make a contribution. Such a pedagogy would have credibility with teachers and could provide useful, relevant and complementary findings to add to our current knowledge of creativity and learning

In the chapters ahead, the research findings canvassed so far will be restated, condensed and used to test the hypothesis of this thesis, through description, analysis, interpretation, application and the use of rubric, template, graphs and a graphic. The qualitative data comprise observation and transcription of whole lessons, and longer periods of learning, as well as questionnaires and surveys across age levels, subjects and through the community, largely, of one particular school.

PART 2 RESEARCH AND QUALITATIVE EVIDENCE

CHAPTER 4

QUALITATIVE METHODOLOGY, DATA COLLECTION AND CONTEXT.

4.1 The hypothesis.

In 2001, after thirty years of classroom teaching experience, I thought it would be a good idea to take stock. The intention was to look more holistically at what had been learned, through the interaction of theory and practice, during those years in seven high schools over continuous periods of three to ten years in England, Uganda and Australia.

After more thought, and dialogue with a number of educators, colleagues in both schools and university teacher education institutions, I concluded that successful teaching and learning, across the curriculum, might have creativity as the common element.

I have always evaluated my practice from a theoretical perspective, from initial key concepts and research findings studied in pre-service education, to those encountered in subsequent degrees and professional education over the years. From 2001, I determined to examine much more fully the concept of “creativity” and the connections it might have with the brain and learning. Consequently, I began studying the literature on neuroscience and cognitive psychology. I also studied developments in the role of language in learning which had always been a core consideration in my educational theory and practice.

I wanted to see whether creative pedagogy in the secondary classroom might contribute to the particularly effective learning I had noted in some of my earlier reflections and whether it extended to subjects other than the arts.

In other words, my “big question” (Neville 2008, p. 3) was whether teaching creatively can make a difference to students’ learning. My “small question” was whether this can be seen happening with some students, in some lessons, across the curriculum in one secondary school:

Focusing on the particular and getting credible information about it, which is often all a thesis can do, is a contribution to a broader effort to find an answer to the ‘big question’ (Neville 2008, p. 4).

The “credible information” would need to include what was happening and what the results were in the rich contexts of actual lessons and activities and from the words and varied perceptions of the participants, commonly referred to as “thick” description. Neville says that ‘... research starts with a question. Theoretical frameworks, methodology, structure and presentation follow from the question’ (Neville 2008, p. 3).

4.1.1 Methodology.

If the methodology was to follow from the question, then I needed specific data of learning taking place, a variety of perspectives on that and some form of indication or measurement.

I had collected a large archive of material/data from full time teaching in secondary schools over many years. There were many reasons for this. My tutor and mentor Dr. Harold Rosen impressed on me as a student teacher, and indeed on all his students, the value of documenting practice. It had been a lifetime’s habit therefore often to write up parts of lessons, whole lessons or projects in a reflective way in order to savour them, learn from them and share them with colleagues in a critical way. I had also recorded on videotape some lessons, discussions and performances.

In more recent years I have also asked whole classes to write, for homework in response to open ended questions, what they learned from a particular lesson’s activities. I have also provided survey sheets to a whole class, to be filled in anonymously, from time to time with only one or two simple, also open-ended, questions about what students had learned.

In my current university teaching, keeping a “reflective journal” of what is experienced on the course is required of students, but not assessed, as a way of promoting reflective practice through writing as a future teacher. Whole class surveys called “just a minute” are also filled in by the students without names halfway through the course where they can honestly reflect on their learning at that stage and the tutor can take account of the responses in her ongoing teaching.

I decided to write more reflective notes on my own pedagogy and gather more data at my then current school, including across curriculum areas other than my own, during the next four years of my teaching from 2002 to 2005. As well as continuing the reflective practice activities referred to above, I also decided to design some surveys for individual students’ responses as well as some student biographies, with written permission from the participants in accordance with Department of Education and Children’s Services’ (DECS) protocols. Material from this recent Australian experience was most readily available and formed centrally the data for my analysis but there were some materials from earlier years that remained and could possibly be incorporated.

When I felt ready to test my original question in relation to the role played by creativity in learning and teaching across the secondary curriculum, I selected data from my collection using four criteria:

- 1. The data needed to come from teaching across the curriculum.**

The research was carried out at an Area School in South Australia from 2002 to 2005 while I was a teacher there. Area schools were originally established in country areas where they catered for young people from Reception to Year 12 who lived in outlying districts and on rural properties. The majority of students were “bussed” to school. Given the urban sprawl of the state capital city of Adelaide and the construction of an expressway to the Adelaide Hills where the school is situated, far fewer students are now from farms or rural settings. Many come from the nearby small town, the fastest growing town in the state, and other similarly expanding townships. The school has a more metropolitan culture than formerly and certainly more than the remaining Area Schools in South Australia.

The students referred to in this thesis were aged from 14 to 17, Year 9 to Year 12. The data were taken from five different, secondary curriculum areas: drama, performance, English, science and maths.

2. It needed to be as diverse as possible.

It included field notes, descriptions and transcripts of lessons, audio and video recordings of discussions, lessons and performances, the students' own talking and writing, and some class surveys. In addition, there were the questionnaires I had developed to test specifically for characteristics of creativity in learning and teaching from whole classes as well as the individual observations of students, teachers and others. I had also written, on an ongoing basis, the developing biographies of some of the students who were regularly involved over the four year period when I was the writing thesis. The biographical cameos were finally shaped and agreed on by the students concerned. They can be found at Appendix (3).

Some of the data was collected when I was a participant or participant observer (that is either as the teacher myself, or part of a teaching team, or in another teacher's lesson where I only observed, occasionally helped or contributed but always within the teacher's methodology); some data was collected from others who were either participants or participant observers. These were School Services Officers (teacher assistants, called S.S.O.s in South Australia), team teachers, relief teachers and older or younger students taking part in the lessons or assisting in them.

3. It needed to cover varied aspects and kinds of learning.

The learning itself varied in terms of the subjects taught, the methodology used by various different teachers, the size and ages of the learning groups and the learning environment. All learning groups and classes were of mixed ability. The perspectives on the activity were from students and adults in different relationships to the learning and communicated in different forms.

4. It needed to include a range of educational outcomes from successful to unsuccessful.

The reasons for this were, firstly, to demonstrate both effective and ineffective practices; secondly, to analyse the reasons for lack of success and thirdly, to reflect and prepare alternative modes of practice. This is a continuing process in the everyday development of theory and practice of the reflective teacher.

5. It needed to potentially demonstrate qualities of creativity.

The key characteristics of creativity and learning which emerged from the research were the key roles and qualities of:

- Language
- Transformation
- Engagement
- Purpose
- Product
- Imaging
- Generation
- Analysis/synthesis
- Discussion/Connections/Criticism
- Narrative/story
- Making meaning/Symbol
- Emotion, involvement, empathy and humour
- Reflection
- Cooperation
- Confidence

The presence, absence or combination of these characteristics in the data, and to what extent they contributed to success, needed to be analysed. The resulting integration of these characteristics might then be translated into a creative methodology for implementation.

4.1.2 Research tradition

Locating my research in a theoretical tradition was more difficult. Firstly, I wanted to test the hypothesis that creative pedagogy in the secondary classroom contributes to particularly effective learning. Testing a hypothesis is a process usually associated with quantitative research. My data were, however, qualitative, descriptive of students and teachers in a variety of learning contexts. Similarly, the questionnaires included quantifiable response options as well as open-ended questions producing qualitative data. I needed a research methodology that would allow me to test a hypothesis but in a qualitative way.

It could be argued that it would require a substantially more extensive and better resourced project than an individual PhD thesis to corroborate such a hypothesis. However, the NACCCE Report (1999) did meet those criteria. It was U.K. wide, had parliamentary status, fielded experts from broad areas of creative activity and involved the experience of class room teachers and other face-to-face youth workers in the study. Its conclusions were not only totally supportive of creativity across educational curricula but also within the arts and industry and bequeathed detailed pre and in-service planning to bring this about.

The hypothesis considered here is then a sub-set of the much larger study. It focuses on secondary, not all, schooling and creative pedagogy, not just “creativity”. In a much more concrete and specific form it tries out the “big picture” in a “little picture” setting, one which has actual students in a specific school and suggests from the findings the extent to which creative teaching could work in more than one subject area and for more than one teacher. The research might be able to both corroborate and contribute to the change in direction recommended by NACCCE but which was not wholly implemented. Indeed, without the force of a national imperative on the value of “creativity”, the only possibility for those wishing to adopt a creative approach would be to try to practise creative methodology alone or in small groups of colleagues and this particular research might be useful in such circumstances.

However, even given the above state of affairs, it could be further argued that this study might be better situated within the discourse of narrative, descriptive and interpretive methodologies supplemented by qualitative reduction and analysis. But I believe that testing a hypothesis provides a clear focus for the research and that the element of quantitative data associated with that helps in a number of ways, particularly in analysis, testing and revision.

In terms of theoretical traditions in educational research, I appeared to be within the broad orientation of “humanist”. Qualitative methodologies associated with this tradition were those of hermeneutics, ethnography, phenomenology and phenomenography.

Some characteristics of ethnographic research seemed to fit: first hand observations, conversations with those studied and participation in longitudinal research with a group sharing their stories and lives. However, largely because of my role as a teacher, many other techniques of ethnographic research were either inappropriate or limited in applicability, such as fieldwork, interviews, scrutiny of local beliefs and perceptions, case studies. In my data, beliefs and perceptions are often the focus of learning activities but I do not examine them in an ethnographic way as part of the research. Some case studies are useful, such as the student biographies, but above all my purpose is distinct from an ethnographic study in that it seeks to reflect on my practice as a teacher in relation to creativity.

Phenomenology, with its prime consideration of subjective experience and sensory experience, and hermeneutics, with its emphasis on interpretation, meaning and social text, were related to my study but indirectly and only in as far as they pertained to the educational context.

Certain qualities of phenomenography seemed appropriate. It is a qualitative research methodology; it has been used as an approach to educational research since the 1980s (Marton, Hounsell & Entwistle 1984; Marton & Booth 1997); it seeks the description, analysis and understanding of experiences; it adopts an empirical orientation and investigates the experience of others; it allows researchers to use their own experience as data and also purposive (not random) samples.

However, phenomenography sorts the perceptions emerging from the analysis into categories, relates them to each other hierarchically and finally produces the essence of the phenomenon. What I needed was a methodology that could provide a framework for testing a hypothesis through a variety of largely qualitative data, the intended outcome of which was the development and application of an educational pedagogy.

The relationship between my topic and my research approach did not appear to fall neatly into a traditional methodology. At this stage, therefore, I turned to literature on qualitative research more generally (Marshall & Rossman 1998, Cresswell 2007; Silverman 2005, 2006). All of these authors explore the nature of “qualitative” research and discuss the differences between “quantitative” and “qualitative” methods. Silverman summarises the differences succinctly in a table:

	<u>QUANTITATIVE</u>	<u>QUALITATIVE</u>
OBSERVATION	Preliminary work, prior to framing questions	Fundamental to understanding another culture
TEXTUAL ANALYSIS	Content analysis, counting in terms of researchers’ categories	Understanding participants’ categories
INTERVIEWS	Survey research, mainly fixed choice questions to random samples	Open ended questions to small samples
TRANSCRIPTS	Used infrequently to check the accuracy of interview records	Used to understand how participants organise their talk and body movements.

Table 8.1 (Silverman 2005, p. 111).

He also adds, ‘There are no right or wrong methods. There are only methods that are appropriate to your research topic and the model with which you are working’ (Silverman 2005, p. 112). This seemed to support my initial intention to collect data from participants in diverse lessons across the curriculum and see the degree of creativity shown.

Silverman and other experts in the area of qualitative research also put the argument for a combination of quantitative and qualitative methodology in appropriate circumstances. They say that quantitative measures such as counting based on categories in context of comprehensive data treatment, can give the flavour of the data as well as making it possible to test and revise generalisations (Silverman 2005, p. 220; Kirk & Miller 1986, p. 10).

However, it was finally, the recommendations of Miles and Huberman (1994) which proved the most appropriate way for me to answer my question. They outlined a methodology which would give me the opportunity to use largely qualitative data in response to some “principles” for the methodology and “four tools” for the analysis.

4.1.3 Principles

Miles and Huberman say that the “strengths” of qualitative data used in the way they suggest are:

- Naturally occurring, ordinary events in natural settings - in real life.
- Local groundedness: data collected in close proximity to a specific situation, a focused and bounded phenomenon embedded in its context.
- Richness and holism; revealing complexity; ‘thick’ descriptions that are vivid, nested in a real context and have a ring of truth that has a strong impact on the reader.
- Collected over a sustained period; powerful for studying any process (including history).
- People’s ‘lived experience’ is well suited for locating meaning connected to the social world.
- The best strategy for discovery, exploring a new area, developing hypotheses and testing them; seeing if the predictions hold up (Miles and Huberman 1994, p. 10.)

This last point met my need for a methodology that could provide a framework for testing a hypothesis through a variety of largely qualitative data.

Relating these “strengths” directly to this thesis:

In Chapters 5, 6 and 7:

- (a) The data selected are those collected in a specific school situation: classrooms, drama room, school hall, science laboratory.
- (b) The data from a real context are vividly described. The data chosen can include close analysis of language in discussion from classroom transcripts: English, drama, science and mathematics lessons, rehearsals, performances, laboratory experiments.
- (c) The data are collected over a sustained period to enable process to be considered: 2002 – 2005.
- (d) The data are interpreted in terms of meaning in relation to the society in which the students live: youth matters, social topics, media, and environmental and scientific issues.
- (e) The initial hypothesis of the relationship between creativity and learning is tested: using the Learning and Creativity Codes and analysis.

4.1.4 Four tools for analysis

Miles and Huberman recommend the four following methods of data collection: data selection, data reduction, data display, conclusion drawing/verification.

4.2 Data.

4.2.1 Data collection

Data collection techniques frequently used by teacher-researchers include direct observation, interviews, questions, attitude scales, records, and artifacts (Mills 2006, p. 43). In addition to these, Chapman (2003) lists self-report measures, rating scales, work sample analysis, and focused case studies.

Some of these techniques, such as direct observations, are only possible with a group or team of observers. They then confirm measures of interpretation which are standardised across the team. This is clearly impractical for the reflective classroom teacher who, unless part of an external research project, is both participant and observer.

For a different reason, focused case studies, usually restricted to a small group of target students within the total context of the classroom, were inappropriate. I was looking at the learning of whole classes in relation to creativity.

Most of the remaining techniques are used in an appropriately modified form. Self report measures, which usually include affective questions and attitudes towards learning, are manifested in the individual questionnaires. The lesson transcripts contain both work sample analysis and descriptions of artifacts, or creative products. Summative rating scales of student learning by the teacher are represented by the teacher devised Learning and Creativity Codes.

The data collected are as diverse as possible and deal with varied aspects and kinds of learning. They come from across the curriculum including five different teaching areas, drama, performance, English, science and mathematics. The data came from the material I decided to collect at the Area School from 2002 to 2005, apart from two letters written by former students many years ago. Of this material I used all the questionnaires, surveys and observations and all the transcripts. All the lesson notes were also used except for some in drama and English. There were more descriptions of these two subjects available because I was actually teaching them rather than observing other teachers of other subjects at work in my non-teaching lessons. I selected the drama and English lessons on the basis of variety of activity undertaken not on the perceived quality of the lessons.

The ethics approval was granted by the Department of Education and Children's Services (DECS) in South Australia (22.03.2007). The letter stated that the project had been reviewed 'with respect to protection from harm, informed consent, confidentiality and suitability requirements'. A copy of the letter which had been sent to the principal of the Area school conveying the DECS approval subject to his agreement was also forwarded to me. The principal's agreement was not only given but the project actively supported.

DECS further confirmed (17.05.2010) that 'access to data on school, students and teachers for the purposes of research', which includes data from my own lessons, 'extended from the period 2002-2005'. No data from the school, students or teachers

was used in the thesis outside the period 2002-2005 and all of it was with informed consent. The individual students who were quoted in the seven biographies, now in the Appendix (3), signed permission statements themselves, having left school by the time the biographies were finished. The six students quoted in the science experiment had signed parental permission.

The data comprise audio and video recordings, field notes, photographs, questionnaires and surveys. These still exist in secure keeping.

Techniques used are interpretation and examination of lessons from recordings and notes; lesson transcripts from audio and video recordings, lesson observations by participants/participant observers, surveys and questionnaires by the participating students, former students and adults in a variety of roles and whole class evaluations. A number of aspects of this data selection need amplification.

The many angles on the learning as well as the rich variety of subject areas, activities and students enhance the possibilities and opportunities for replicability.

4.2.1.1 Participant observer protocols and ethics

A generally accepted definition of “participant observation” as a research method is that ‘... the researcher is, to a greater or lesser extent, immersed in the day to day activities of the people being studied’ (Social Sciences and Humanities Research Ethics Board SSH REB 2010, p. 1). Such research, it is argued, captures the time and place in which the activity occurs and can convey a rich understanding of the situation and the participants.

There are a number of researcher roles within the method. These are complete participant, complete observer, participant as observer and observer as participant. As a teacher who conducts reflective practice, on my work with a class, I am a participant observer. There are times when I have the opportunity to observe another teacher’s lesson, at which stage, if I become included in any way, I become an observer participant. Team teaching, when it occurs, falls into the participant observer category. I have adopted these two participant observer roles for my research. It has also been noted that within the participatory role, the researcher, like the teacher in a class, creates

space or distance between herself and those being researched, or taught, to allow for analysis (Hammersley & Atkinson 1983, p. 103). Notes need to be kept, if possible during the activity and a journal as soon as possible afterwards. My notes were more often made immediately afterwards, or taken from a video or tape recording. My journal writing was on the day or within days.

There is a range of issues related to this kind of research which are both academic and ethical:

- The changing nature of the researcher's roles(s) and relationships over time.
- The long term interface between the researcher and the subjects of the study and the effect of this on the development of the relationships and interpretation of the data.
- Wide ranging relationships with differences of status, power, education and degrees of formality.
- Variety of settings including the close and interpersonal; large groups and social events.
- Objectivity challenged by unsystematic gathering of data, reliance on subjective measurement, observer distortion through bias or empathy and the researcher affecting the phenomena being studied, as teachers do.

The qualities listed in this last issue are of paramount importance in my research. As Adler and Adler (1994, pp. 377-392) point out, subjectivity is inherent in participant observation with the attendant threat of researcher bias in relation to what data is gathered and how meaning is assigned.

Ways to address these issues:

- Being aware and open about the variety of roles of the researcher and their evolution over time.
- Being sensitive to differences of status, power, education, gender, class ethical views and culture.
- Informed consent to the research must apply both verbal and written.

- Confidentiality must be made explicit.
- Permission for the research must be sought and gained from leaders of institutions and the organisation involved.

In answer to my initial question, I have engaged in this research to try to see whether elements occur in a creative learning process in the classroom. These include evidence of the brain processes outlined by neuroscientists at work; the role of symbol in the form of language, imagery, number and visual creations; and the social nature of the student activity.

The subsequent question is whether this will lead to an actionable pedagogy. In doing this many teaching qualities, such as empathy, student relationships and cultural differences will inevitably be present. The best way to address these in the data must surely be researcher honesty and triangulation, that is, comparing, contrasting and analysing through other views and perspectives, the same activities. Additionally, all these participants must be aware of, and consent to, their views and actions being referred to anonymously and confidentially within the research. Such was the declaration made by me to my employer when receiving ethical permission to complete my study.

4.2.1.2 Replicability.

This is allied to the above discussion. Is it possible to replicate research of this kind? Unlike, for instance, a chemistry experiment, the process being examined cannot be exactly reproduced because the human subjects will respond differently individually and in interaction with each other in different circumstances. The replicability of this research lies in the analytical method applied to diverse learning situations allowing for the identification of creative elements within the process.

In other words, a test of replicability is that it works in a number of different situations whatever the class and the teacher. The replicability lies in the likelihood of a reasonable match. The learning template provided in Chapter 8 seeks to serve this function. It provides the opportunity for any teacher of any class to prepare a lesson or series of lessons based initially on axes of engagement, purpose and product from which

other creativity characteristics can occur. The template also enables the teacher to evaluate afterwards where any changes can be made next time. This process is described in operation in Chapter 8. Reference is also made there to its success, in pilot form, with middle school teachers at a conference and by pre-service teachers under my supervision.

I have formulated a pedagogy, in template form, to allow for transferability. Plainly I believe that with the same pedagogy creative teaching and learning can occur in the work of teachers other than myself and the incidence of creative qualities be similarly evident in their work.

In short: the research methodology can only be loosely replicable, because of the varying aspects of context and participants. Nevertheless, it can be replicable in two respects:

- (a) The role of the teacher-researcher as participant observer, observer participant and reflective practitioner on his or her own practice is now well established in the literature and, given a community of teacher-researchers who can share their experience, including information about the methods they have used in their research on their own practice, would provide a means of replication in practice and testing through sharing of results and experience.
- (b) This would provide data of a very reasonable degree of commensurability and, moreover, the greater the extent and continuation of the community of sharing, increasing commensurability.

The pedagogy, since this will be derived from my research findings, will be a way of producing and analysing creativity. The promotion of creativity comes from the process, outlined in Chapter 8, and the analysis from the presence of the codes or characteristics found in the research. It is possible therefore to replicate both a creative methodology for learning and to analyse the learning afterwards in order to change or improve. Often the process and the principles work in unison. Sharing of teacher experience, mentioned in the preceding paragraph, will enhance each individual's experience of this process.

4.2.1.3 Audio and video recordings.

Using audio and videotapes of classroom activities, discussions and plays are essential to my research because, respectively, they capture the richness and complexity of the actual event in terms of language, voice, rhythm, texture, imagery and movement. Three other advantages advanced by Silverman (2006, p. 204) are that compared to other data, they are a public record; they can be replayed and transcripts improved; they preserve sequences of talk.

I have relied on audio tapes more than video for the following reasons. Firstly, as a reflective practitioner, a teacher alone with a class, it is much less disruptive to the process of teaching for me to just turn on the tape recorder. Secondly, on the occasions when I, or a student from another class, used a video camera, it did have an intrusive effect on the student activity. I have found that students quickly forget that the tape recorder is on but are for a long time aware of being filmed and behave differently when the camera is recording. Thirdly, what the camera sees is still a particular and narrow angle of perception when stationary, and indicative of the camera operator's way of looking when mobile. Both versions are further interpreted and analysed in different ways by the viewer. Having said this, there is no doubt that physical and emotional qualities are better captured on screen and they are a worthwhile element of research.

4.2.1.4 Transcripts

These written records of what can be heard on audio tapes or appear on videotapes are particularly important for research into creativity in the classroom which occurs largely through the medium of language allowing us, according to Pinker (1995), as mentioned earlier in Chapter 3 (p. 85), the best chance of seeing how the brain is working and the connections being made.

Transcripts are quite different from a salvaged phrase chosen from a questionnaire or survey to support a point being made by the writer. Earlier examples of similar research are worth noting here, especially since the researchers, Britton (1972) and Barnes (1971) were exploring language and learning. Relatively long extracts from transcripts

appear in their work. In Britton (1972, pp. 240-248) a conversation by secondary school, female students, without adults present, on the subject of personal relationships is compared to a dramatic improvisation involving a welfare officer, a mother and a foster mother. Personal relations are seen internally and externally by the students in these two activities. Britton interprets, by use of the extracts, the kind of talk, and especially the value of the explorative talk, leading to new realisations and, in the dramatic representation, the new generalisations for later discussion. He maps the thinking through analysis of the talk found in the extracts. Barnes et al. (1971, pp. 14-19) similarly reproduces lengthy excerpts from lessons to consider examples of talking to solve problems and talking to learn. He also outlines, exemplifies and analyses, from material provided by collaborating teachers, the various attributes at work in the language: spoken and written, teacher or student initiated, open and closed questions and so on.

4.2.1.5 Reliability and validity.

Silverman points out that, ‘... unless you can show the audience the procedures you used to ensure that your methods were reliable and your conclusions valid, there is little point ... (Silverman 2005, p. 209). In order to achieve such reliability, I have asked the same questions of the variety of observers and participants in the process and recorded them under grouped headings. I have also used tables and a variety of figures to chart the occurrence of learning and creativity characteristics from lessons and transcripts from different viewpoints:

Reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions (Hammersley 1990, p. 57).

In terms of validity, or a faithful representation of what is being described, I have been alert to the trap of choosing only favourable examples. In the following chapters I declare my reasons for selecting some and not other examples or observations or answers to questions when this occurred. I have taken as a guide Hammersley’s comment, ‘By validity, I mean truth: interpreted as the extent to which an account accurately represents the social phenomena to which it refers’ (1992, p. 67).

However, even this definition of “truth” involves interpretation and perception. There is no single way to perceive experience or transmit knowledge of that experience, given the complexity, richness and emotion of the human experience. There are a number of ways, though, to attempt validity; one is through accuracy and openness. To this end I have combined different ways of looking at the same activities and included different conclusions from the observations when they occurred. These can be found in Chapter 7 (7.3.1-7.3.2), ‘Adult responses’, ‘Student responses’, and ‘Other’. In all cases specific lessons, activities and aspects of teaching and learning are responded to from different perspectives. Although such “triangulation” has its critics, it does contribute further insights which are, in this case, not those of the author, for consideration and analysis.

In another attempt at validity (7.3.2), I have used a form of “respondent validation” from whole classes by asking students verbally or in writing what they made of an event, also described by others, using open ended questions. I have attempted to be “comprehensive” in my accounts, including the “deviant”, which is often useful to rigorously test a possible generalisation or finding.

4.2.2 Data reduction.

This involves transformation of data through selecting, focusing, simplifying and abstracting. As the process progresses further reduction occurs in summarising, clustering and teasing out themes

In this thesis reduction occurs through interpretation of lesson notes and transcripts. They are tested for creativity and learning characteristics through description, understanding and analysis. Clustering and thematic appraisal of the material is made through analysis of the observations and questionnaires.

The data, and the tables and figures formulated from them by way of reduction, are displayed in Chapters 5, 6 and 7. They are the subject of lengthy discussion regarding the reductive process and the meaning that can be ascribed to the results. One of the many issues of significance discussed is that of transferability, whether this is the work of one particular teacher or whether it can be generally practised.

4.2.3 Data display

The data in relation to learning and creativity characteristics are entered on a grid and tabulated in relation to frequency of occurrence (after p. 218):

TABLE 2 LESSON DATA ANALYSIS - LEARNING CHARACTERISTICS;

TABLE 3 LESSON DATA ANALYSIS - CREATIVITY CHARACTERISTICS;

TABLE 4 LESSON DATA ANALYSIS - LEARNING AND CREATIVITY CHARACTERISTICS TOTALS.

These data are also graphed on a scatter plot to show correlation between creativity characteristics and learning characteristics (after p. 220):

FIGURE 1 LESSON DATA ANALYSIS LEARNING/CREATIVITY CORRELATION PLOT.

The data in relation to creativity and teacher attributes are also entered on a grid and tabulated (after p. 235):

TABLE 5 QUESTIONNAIRE RESPONSES

These data are also displayed as a bar graph (after p. 235):

FIGURE 2 QUESTIONNAIRE RESPONSE ANALYSIS - ATTRIBUTE FREQUENCY

A graphic is constructed for use in the application of a creative pedagogy (after p.252):

FIGURE 3 TURNING THE LEARNING WHEEL.

A template encapsulating a rubric is tabled as:

TABLES 6, 7 AND 8 CREATIVE PEDAGOGY TEMPLATES (pp. 257, 260, 262):

4.2.4 Conclusion drawing/evaluation.

This is the conclusion drawn from the data in relation to what was being tested or hypothesised. In this thesis the findings are described and applied. Conclusions are finally drawn (Miles & Huberman 1994, p. 12).

Describing the findings, forming some conclusions and applying them take up the last part of the thesis, Chapters 8 and 9. The two central ideas here are application by way of pedagogy and reflective practice.

4.3 Data collection in context

4.3.1 The school.

The educational practice referred to in this thesis occurred almost entirely at an Area School, a public school in South Australia located in the Adelaide Hills and catering for five hundred pupils from nearby farms, villages and a town.

The Area School was a suitable site for this research for many reasons. Firstly, being a teacher there while conducting research allowed me an observational and participatory role. This approximates to the mental stance of the reflective teacher who is involved in the process but also able to stand outside and appraise it. Secondly, it is a Reception to Year 12 site which allows for the easy availability of information and knowledge of students during the whole period of their time at school; this is evidenced in the student biographies in the Appendix (3). It also allows the possibility of vertical or age grouping of students and the availability of younger audiences or pupils for secondary students to work with, see Chapter 5 (5.3.1) the group created scripted play for Reception to Year 7 audiences and Chapter 6 (6.1.3) the effect of a Year 7 pupil being present in a Year 10 drama discussion on racism. In research terms this adds to the variety of “kinds of learning”.

4.3.2 Participating students.

Over a nine year period of research, there were obviously many hundreds of students who were in classes referred to in this study. However, a group of seven students were frequently involved for a four year period as they moved from Year 9 to Year 12. They also provided individual comments and insights into their learning experiences in the qualitative surveys presented later. I include their profiles, with fictitious names, to give a flavour of students’ lives and learning during this time. This was done through

individual informed consent on a confidential basis and agreed in writing in Appendix (3).

4.4 In summary.

That creativity has strong connections with learning, language and thought was argued in the first three chapters. In chapters 5, 6 and 7 my own and others' practice will be used as evidence to critically evaluate the theory by means of the methodology outlined in this chapter. In Chapter 8, in conjunction with the research evidence, a methodology of implementing the theory will be developed and evaluated.

PART 2

CHAPTER 5

LESSONS

5.1 Lesson description and interpretation by participant/participant observer

As stated in the consideration of qualitative methodology, the following data are selected from a large quantity collected over many years from secondary class rooms. Each piece of data is labeled in terms of time, place and situation and the nature of the participant/ participant observer roles are also made clear in line with the discussion in Chapter 4 on participation, observation and ethics. The data selected are as diverse as possible and deal with varied aspects and kinds of learning. They are from across the curriculum and include five different teaching areas, drama, performance, English, science and maths.

In line with the methodology adopted:

- The data selected are those collected in specific school situations.
- The data vividly describing a real context are reported.
- The data are interpreted in terms of meaning in relation to the society in which the students live.
- The data are analysed in relation to the initial hypothesis of the relationship between creativity, learning and language.
- The data are collected over a sustained period to enable process to be considered.

5.1.1 Creativity and learning codes.

The following sections of this chapter deal with lessons or longer periods of learning in the five curriculum areas specified. The description of each seeks to meet the above criteria. It is recorded from a real classroom situation; it is vivid; it has social connotations in terms of what is being learned; it includes material from over longer periods and is analysed for creativity and learning characteristics. These criteria derive from the chapters on creativity; learning and language and are my attempt to categorise

and name them as elements in practice. They are entered on to an analysis grid (Table 1) below which is later converted into a scatter plot graph.

TABLE 1 LESSON ANALYSIS GRID

Lessons	1	2	etc	1	2	etc
<u>LEARNING CODE</u>				<u>CREATIVITY CODE</u>		
EXPERIENCE				ORIGINAL/NEW		
building on	LEX1			CO		
CONNECTING				IMAGINATION		
	LC1			CIM		
EMOTION				PURPOSE		
humour	LE1			CP		
empathy	LE2					
engagement	LE3			PRODUCT		
confidence	LE4			CPR		
relationships	LE5					
trust	LE6			MEANING/SYMBOL		
excitement	LE7			CM		
LANGUAGE				EMOTION		
discussing	LL1			CEM		
criticising	LL2					
narrating	LL3			TRANSFORMATION		
thinking	LL4			CT		
reflecting	LL5					
writing	LL6			COOPERATION		
reading	LL7			CCO		
IMAGES						
patterning	LI1					
imaging	LI2					
imagining	LI3					
<u>TOTAL</u>						

While this exercise may bring to mind Shelley’s words, ‘It were as wise to cast a violet into a crucible that you might discover the formal principle of its color and odor, as seek to transfuse from one language into another the creations of a poet’ (Shelley 2004, p. 30), this method of data display, also referred to in the discussion of appropriate qualitative methodology, does provide data reduction in terms of this thesis and enables the data to be tested in relation to the original hypothesis.

The “Learning Code” and the “Creativity Code” are each composed of those characteristics which emerged from the first three chapters on “Creativity”, “Learning” and “Language”. The characteristics were identified from relevant literature, discussed and then listed at the end of the respective chapters. They were linked at the end of Chapter 3 and defined the dimensions through which I might be able to answer my initial question: Does teaching creatively improve learning? The data will provide evidence; the test will be the degree of correlation between learning and creativity.

The codes enable the process of reduction to begin by grouping characteristics which have a number of similar or related qualities under headings, such as:

LANGUAGE

discussing
criticising
narrating
thinking
reflecting
writing
reading

Or

IMAGES

patterning
imaging
imagining

The use of the words “imaging” and “imagining” may need further explanation. These words are used to describe related but different processes. I have defined ‘calling up an image’ as a way of selecting and focusing internally on one element of an issue or experience in order to further explore the image itself and the issues or experiences it is related to. An example would be calling up an image of “fire” and then exploring issues and experiences related to “fire” as part of English, S.O.S.E. or art. Another could be calling up an image of the moon and Mars in the night sky and considering that from the point of view of distance or time as part of science or mathematics. Calling up images is the fabric of the creation of poetry, narrative and drama or any subject when focus and exploration are sought. It relates back to the importance of imagery combined with

or manipulated by words as the way we think, from a neuroscience perspective. Imagining, on the other hand, involves creating anew a scenario, series of events or consequences, seeing them internally and often in sequence. This too is an important part of artistic and scientific creation and exploration.

The elements of classroom learning are interpreted according to the codes on the above grid by the teacher, in preparation for later tabulation and reduction. They are the perceptions of the experienced and professional teacher who, as she has to do in all lessons, is creating space or distance between herself and those being taught, to allow for analysis as the lesson progresses and afterwards in her reflective practice. She cannot be completely immersed (participant) in the lesson, nor completely detached (observer) because she is shaping and affecting the activity in terms of the educational aim of the lesson for all of the students present. This mental “distance” was discussed in the previous chapter at 4.2.1.1 (p. 113), referring to the work by Hammersley and Atkinson, as a necessary quality for the participant researcher. However, such interpretation is still open to the criticism that it is unable to be corroborated, and is necessarily biased. In discussing methodology earlier the point was made that all perceptions are unique but can be given wider credibility if they are shared by different people from different vantage points pertinent to replicability discussed later. The sections on transcripts, questionnaires and surveys contain such triangulation where data from lessons are observed and assessed by others in various ways.

In short, the lesson descriptions which follow include:

- I. Subject, student year level, place, time.**
- II. Researcher role.**
- III. Lesson description from original reflective journal entry.**
- IV. Assignment of ‘codes’, to be collected and tabulated later in order to see the respective frequency and relative significance of instances and any correlation between learning and creativity. Such a process will not have mathematical precision but should reveal trends and themes.**
- V. Consideration of the journal entry data in light of the research literature presented in this thesis as well as further research.**

5.2 Drama.

These extracts from drama lessons and groups of drama lessons were selected to show a variety of subject or genre relevant concepts and capabilities being learned by a variety of students in different secondary age groups over short and long periods.

5.2.1 Emotion as trigger (Year 9, drama room, term 2, 2004).

Description (as participant observer).

On this occasion, I had chosen a very broad, topical and open-ended theme for the Year 9s' group devised plays "Fear".

Two of the improvisations which were created (CT) (CP) by the students were scenes of war which was not surprising given the fear of war with Iraq at the time. One concerned the First World War and the other the war in Vietnam. In terms of acting, both plays were striking in their use of dramatic lighting, chase effects (flashing lights), sound and imaginative (LI3) use of props: a metal microphone stand was used upside down and in a circular movement for the helicopter, four chairs, the back two on a block, gave the impression of a jeep. In both scenes the sound effects were made by the students very convincingly. The staging and props were about making a known, old or other thing into something new (CT). They were also assembling several, until now, unconnected facts into an integrated whole (LL4).

The third improvisation took place in an airport where there was a suspected terrorist: a topical issue. Dramatically the scene was notable for its use of two groups talking at once through a cross fade/mime technique and through introducing a sub plot. The former was discussed in terms of theatrical acting and the latter in relation to TV drama and films' use of one or more sub plots. We were learning here about professional, creative technique in conveying ideas dramatically and symbolically (CM).

The discussion was about racism. The boy playing the terrorist was "dark" and spoke a "foreign" language. He was therefore suspect. We talked about how people were more suspicious of such people nowadays. One example was the story (LL3) of a man

wearing a turban on a bus from Port Pirie to Adelaide and how he was isolated on the bus by the other passengers. We talked about Australia as a multicultural society and how fear and suspicion could very quickly break that down. The images (LI2) in the scene, which we had made, became the experience which we could talk about through language (LL1) and understand by analysis and synthesis (LL4).

Comments (social, creative and learning elements).

The society in which the students live was the fabric of the creation. It included reference to and understanding of elements of multiculturalism, racism and terrorism as well as wars in Iraq and Vietnam. Connections were being made (LC1), so important in neuronal development and maturity which were examined in Chapter 2 (pp. 50-51; pp. 63-64) (Greenfield 2000, 2004; Damasio 2006).

In order to make up the plays the students had intense discussions about both wars, about family and friends' involvement and about the causes of the wars. They began to be able to generalise (LL4) about war not just for academic or human interest but so it could be convincing and moving to the audience. The generalisation, "war", was a "coat hanger" (LI1), which would continue to be draped with the clothes of events and views as time passed. This was discussed in Chapter 2 (pp. 63-64) (Greenfield 2001; Torey 1999; Damasio 2006) as the "complex" or framework necessary to move from the particular to the general in terms of abstract thought and higher order thinking Chapter 2 (p. 64) (Bloom 1956).

The creative process and making meaning (M) enabled better understanding of cultural and topical issues and arose out of consideration of techniques used in commercial media for the purpose of making the plays convincing. On this occasion, the creativity led to the meaning being made. The transformation, by way of the product (PR), drove the students to engage (LE3) with the ideas in stronger ways than discussion alone.

The relevant concepts and capabilities within the subject of drama, and this genre in particular, were also learned: special effect lighting, cross fades, sound effects and sub-plots.

5.2.2 Youth issues (Year 10, drama room, school hall, term 2, 2002).

Description (as participant observer).

Unusually, a Year 10 drama class decided not to do a scripted play for their final performance (CP) (CPR) at the end of semester. Instead they combined self-devised scenes and professionally scripted ones acted in groups (CCO) under headings which they had chosen such as unemployment, sex and relationships. These were preceded by a title and stereotypic images (LI2) on a screen. This was done because their intention was to show the contrast between stereotype and reality

They performed “Scambo: The Slide Show” on two nights. The title was the product of long discussion and was finally chosen on the basis of including everyone’s scenes in the form of an acronym (LL1) (CCO). The learning qualities associated with serious, purposeful discussion were demonstrated clearly here as views were expressed and compromise found. The length and nature of the discussion could not have happened a year earlier. How to discuss and value discussion had been learned gradually in many different situations during that time. It also required, and showed, growing maturity. This process and event also had some important qualities for both acting and understanding particularly in the reflective area (LL4) and the ability to not only hold two concepts in the brain at once (the stereotypical and the real) and compare them but also to make the audience do so (CM). The students analysed youth issues and then synthesised their interpretation into a dramatic version for an audience who then interpreted them for themselves (CM).

Real issues and life issues were learned about through the process. The irony was that three of the cast had left school during the production due to exactly the issues we were dealing with: family harassment, an alternative life of sexual freedom and drugs, drugs and violence!

In the first lesson, with the twenty two students sitting in a circle, the teacher suggested that they try to discuss their chosen topic “unemployment” seriously for perhaps twenty minutes (LL1) (LL3). The question posed was ‘Why do you think there is unemployment?’

The views, ideas and levels of perception were remarkable and went far beyond what the teacher had expected. The responses also fanned out quite naturally from the initial question. The issues included, exploitation of young workers, the population, migrants, the rejection of older workers, selling off Australian companies overseas, global markets, profit, the effects of the dole, disability, strikes, the effect on relationships when there was too little money or when one person alone worked while the rest of the family didn't (LL4).

As is often the case the discussion went on into recess and the next day the teacher congratulated the group on the length (50 minutes) and interest of the discussion. One of the students replied, 'It's because you listen to us.' It would seem then that one element in the process of encouraging student discussion and reflection (LL5) lies in having your contribution valued and seriously listened to. "Unemployment" became a concept through which to look at work, homelessness, poverty, harassment and relationships. Some of the student improvisations which followed the discussions were as follows:

The scene is a chip factory; the actors are the both the machinery and workers (CM). The factory's tour guide is showing around a tourist who is taking photographs and asking questions about the factory process and product. The boss arrives to say that he will have to 'let go' one worker. He points to the tourist who, along with the tour guide, tries in vain to explain. Meanwhile the workers are gesticulating to her to go along with the boss's request and leave the factory. She does so and work recommences with relief, satisfaction and some fear.

The play worked through its visual invention (CO) (CT), clever misunderstanding and humour (LE1). Its message, which was discussed afterwards, was clearly that if the boss is too stupid even to know who is in his work force then using the opportunity to prevent layoffs is acceptable, albeit only short term.

Three of the "small group" scenes also showed understanding of the issues and human empathy (LE2). One showed a family where a mother was cooking potatoes for tea, a

young son wanted \$10 for a school excursion to the zoo and the out-of-work father had to refuse him. The family fragmented violently in anger before our eyes.

Another showed an office where a mother with 'three kids in the car' had not received her fortnightly allowance. She was asked to fill in some forms and then wait endlessly to see someone; meanwhile a disabled person was also trying to fill in forms. Again the scene ended in frustration and anger. The inclusion of bureaucracy into the unemployment issue was an aspect we had not previously included or discussed.

The third scene had several teenagers sharing a house. One worked. Of the others, one tried unsuccessfully to get work, one spent money on mobile phones and internet use and one spent money on drink and cigarettes. The play climaxed with the earner leaving, again, in great frustration and anger.

Comments (social, creative and learning elements).

These plays were microcosms of the array of issues that exist in relation to unemployment. They were learned, understood and developed through student talk, thought and independent group activity (language, thought and cooperation) galvanised by the product which was their improvisation polished into a performance piece. The students also began to understand symbolic meaning in their own and others' plays. For instance, the scene where the tourist is accidentally fired because the boss didn't realise she was not one of his workers symbolised unemployment being to some extent random. That the mistake was not disclosed by the other employees was seen as suggesting that employers don't necessarily know much about what goes on in their work places. The act was also recognised as representing workers demonstrating solidarity.

This process of generalisation reflects the findings in developmental psychology that maturity and the ability to think abstractly grow through a process of 'complex' formation discussed in Chapter 3 (p. 91) (Vygotsky 1962). The connection between what is already known and what is to be learned has been emphasised by constructivist and cognitive psychologists as noted in Chapter 2 (p. 43-44) (Jensen 2005). The role of the generalisation serving as a concept, framework or coat hanger to which the concrete

experiences can be attached, further expanded and understood was also referred to in that chapter (pp. 64-65) (Torey 1999). In short, the formation of a generalising concept in the brain allows us to categorise former and future experiences.

The process described above also relates to Vygotsky's 'zone of proximal development', 'the place at which a child's empirically rich but disorganised spontaneous concepts meet the systematicity and logic of adult reasoning' (Kozulin 1986 p. xxxv). In other words, at the beginning of this project the students had only a question; in response to this they brought their experiences to bear to answer and explore it. The end of the process, a dramatic representation, led them to generalisations and new understandings. Bruner, drawing on this work of Vygotsky, developed the concept of "scaffolding". This describes the provision of a progressive framework which leads students from their current learning level to the next one within their range, the gradual withdrawing of the teacher and greater degrees of independence for students (Bruner 1963, pp. 39-40). In this case the "scaffolding" was provided by the ongoing process of question, discussion and improvisation as the students created their own scenes and could then talk about them using abstract terms such as 'unemployment' and 'exploitation'. The issues could finally be expressed in generalisations with concrete examples from the students' own lives and experiences woven into their production.

While it was language in the form of the initial question which galvanised the response, there was also a clearly defined purpose for the discussion. The purpose was an authentic one. The class was going to do something with this information – create a product, in this case a play. It was also their own choice of subject. There is some criticism of the importance of "own choice", "authenticity" and "internal" motivation in educational literature but the considerable research findings in Chapter 2 (p. 40) (Dudek & Coté 1994; Kohn 1993; (Amabile 1983, 1990; DeCharms 1968; Deci 1975, 1980; Golann 1962; Hennessey & Amabile 1988) and my own experience, support the importance of choice and doing it for "real" with the accompanying risk and satisfaction that provide a spur to learning.

Discussion is central to much of this creative process, not just as a way of managing the learning activities of twenty five or so students, but also for the interaction between

thought and language. Such a characteristic in group process and learning is referred to in Chapter 3 (p. 92) (Freire & Giroux 1987; Bullock 1975; Berger & Luckmann 1967).

Discussion doesn't just happen; it has to be nurtured and valued. Frequently, only a few moments of whole class discussion is achievable at first. It gradually grows with teacher encouragement and the class's gradual involvement. The large group discussion guided by the teacher serves as a model for the small group discussions which follow. The same norms of listening to each other, building on what is said, focusing, sharing stories, planning the task and so on usually occur and when they don't can be put back on track by the teacher. The process involves cooperation and reflection (LE3) discussed in Chapter 3 (pp. 98-99) (Freire 1987).

This series of lessons, as part of Year 10 drama, is an example of understanding and sharing social issues relevant to the age group, and chosen by them, through creativity. In particular, it illustrates the role of discussion, language and thought in creative learning.

5.2.3 A life issue (Year 10 drama, drama room, term 2, 2003).

Description (as participant observer).

A Year 10 class had chosen a published play called, "Wasting Away" to perform to a school audience (CPR). Once again, we had here the process of self-choice. The process not only usually leads to greater student involvement but also entails a lengthy time discussing possibilities and, in this case, finding scripts and bringing them to class. This involved reading a number of scripts and being constructively critical about them. The play dealt with the issue of anorexia/bulimia as well as peer pressure, fitting in, sex, fashion, family relationships and so on.

The central question was: why does this culture recognise thinness as attractive in women and why do women kill themselves to achieve this? (LL4). In an effort to find an answer the following process was adopted. The boys and girls were separated. The pre-service teacher (male) discussed the question with the boys separately (LL1).

Students from each gender group then reported back to the whole class. Students discussed seriously and there was a lively, enthusiastic (LE7) debate.

Again, language and problem posing, with a purpose, were the triggers (CP). Emotions were involved because the play was the students' choice on a subject they found relevant and interesting and which they were to perform (LE3). The choice was made after reading a number of plays aloud in class on subject areas of their choosing— itself an activity which expanded knowledge and understanding (LL7).

The pre-service teacher commented that this was what university lecturers told pre-service teachers to do with students but he had never seen it happen before. I replied that I thought discussion about these sensitive issues needed trust and purpose. A trusting relationship with the students had been established over the previous two years and the necessity to understand the issues for the sake of the play gave the discussion real purpose (LE6).

Although separated, the students made similar points. They said that thin, fragile girls looked as if they had to be looked after by powerful male figures. They could be controlled and used. Unlike in the past when pretty girls were fleshy and even added padding to their dresses to show how well the man was feeding and keeping his woman. The male had to look macho as a powerful male figure and there was pressure on boys to develop their bodies. They concluded, in discussion with the teacher and the pre-service teacher that the cultural phenomenon came from power and was economic (LL5). Since these messages came from every medium: advertisements, soapies and magazines, it led to strong feelings of not being “normal” if you didn't fit in. Thus, girls would literally starve themselves to death and boys risk taking steroids and pumping iron for very long periods of time (LL2).

The economic factor was the money made from the products essential for this culture's continuation: Barbie and Ken dolls, magazines, films and clothes (scanty and small for girls and big and sporty for boys) (LC1).

Comments (social, creative and learning elements).

The conclusions of the students' discussions are not "right" or "wrong" answers. Their importance lies in the struggle to understand and to think in a more complex way. The discussion served a purpose in respect of the play but it also allowed articulation about real issues in this age group and a new way of looking at the world through abstract concepts not just concrete symptoms.

Drama lessons comprise much more than just improvisation, performances and productions. While these three activities are still continuously important in organising and galvanising learning, other characteristics of creativity also come into play. These are language, narrative, reflection and meaning. The net is cast more widely; the students' experience of life is our palette. I have called this 'learning acting through life and life through acting'. Although similar to the last example in terms of the subject matter, this social issue is more emotionally tender.

Other differences are the use of written, narrative texts and certain aspects of the teaching methodology, namely the opportunity to have two teachers in the roles of "learner-teacher", "teacher-learner", Chapter 3 (p. 99) (Freire 1987) which added an extra layer of experience and support. The literature, and our own experience, tells us that team teaching can have many advantages in terms of relating to students and providing them with additional attention, as long as they are complementary and collaborative. Other advantages and disadvantages, regarding time, the effects on students and the views of team teachers are comprehensively discussed by Goetz (2000).

The links made between culture, power and the economy, forged through the creative process in this lesson show new connections being made and may indicate the neuronal connecting and abstraction seen as the initial elements of moving to higher order thinking found in the research literature, Chapter 2 (pp. 63-64) (Greenfield 2001; Bloom 1956).

5.2.4 Negotiating the curriculum (Year 10, drama lesson, drama room, term 2, 2005).

Description (as participant observer).

Twenty two Year 10 students had been asked to choose a social issue to explore and dramatise. They decided that they would like to include a number of issues in their drama lessons during the term (CCO) (CP) and make plays out of them (CPR) (LE3). The process of negotiating the curriculum in this way is also a creative act (CT).

On this occasion the students had sat in their usual circle and thought of any three issues. After hearing all of them, it was suggested that we reduce the number to about five and that these should be “umbrella” issues for others (LI1). For example, one student pointed out that “war” could cover homelessness, violence, abuse, and poverty.

The first of the five issues chosen was eventually “war”. The students had already generalised about this in two ways (LL4). They knew that war encompassed other issues they were interested in; they were also aware that there were many different kinds of war. Many stories of war were shared, a topical death at war, a family member lost in war and great wars of the past.

Comments (social, creative and learning elements).

As so often, the initial question, or questions, set off the search for answers and problem solving, an important component of learning and creativity stressed by Dewey and later educators and researchers, Chapter 2 (p. 41) (Savery 2000) and Chapter 2 (p. 56) (Blakemore & Frith 2001).

Negotiating the curriculum by class and teacher is a creative act in that it produces something original or new for a purpose through a process of preparation, incubation, illumination and execution Chapter 1 (p. 11) (Wallas 1926). The early lessons of discussing possibilities and mapping out the territory are the preparation, the thinking time or incubation follows and does have a limit given that this is a school activity; illumination emerges by way of discussion, often in a surprisingly united fashion, and the execution is the final product or products.

This suggestion of some key issues forming umbrellas for others is an example of connections being made and also demonstrates the ability to see in patterns Chapter 3 (p. 82) (Damasio 2006), Chapter 2 (p. 65) (Bruer 1997) and (p. 36) (Caine & Caine 1998). It was a complex mental exercise to solve the problem like this and also creative in the unusual (for young students) intention to present “war” with associated social issues.

Narrative, Chapter 3 (pp. 96-97) (Connelly and Clandinin 1990) was both a way in to understanding an issue and learning from it as well as a way of engaging students’ interest (LE3) because of the attention created by the story mode (LL3).

This was also a step forward in thinking; the example of realising that on the coat hanger of “war” there can hang other generalisations, as well as examples. These are the abstract descriptors of homelessness, violence, abuse, and poverty. The examples could obviously be a soldier killed in Iraq, my uncle who went to Vietnam or the Spanish Armada or a thousand other floating fragments.

While personal narrative is the way in to most discussions and improvisation, this example demonstrates it as part of the creative process particularly clearly. Associated with personal, shared narrative is reflection and the struggle for meaning, an important characteristic given its essential role in thought and speech and its central significance in creativity, Chapter 1 (p. 23) (Greenfield 2001), Chapter 3 (p. 94) (Halliday 1975), Chapter 2 (p. 36) (Jensen 1998) and (p. 69) (Caine & Caine 1994)

5.2.5 Symbol (Year 9, drama lesson, drama room, term 1, 2005).

Description (as participant observer).

Although children and adolescents can think and talk and write mostly with ease, they find it difficult to understand the concept of “symbol” itself. In my experience it becomes possible as they mature and learn to handle abstract concepts with greater ease.

I was therefore surprised and delighted when some Year 9 students created their own understanding of symbol (CO) (CT). The exercise which led to this was a simple one. The class was learning about costume and the effects costume has on acting and actors, performance and success with audiences. Each student had a couple of self chosen garments. They had been through a process (in a circle) of naming themselves and identifying their age and employment (CIM). They then brought their characters to life in a simple first scene (CT). The characters then met in groups of four at a bus stop. The whole class watched what happened to each group.

In one group a vagrant drinking a bottle of alcohol reeled drunkenly to the bench at the bus stop and collapsed on to it. A mad-looking individual wearing a silver tinsel hat arrived, immediately seized the drunken man and cut his throat. While this was happening, an “official” looking person arrived wearing an air force hat and trench coat and attempted to stop the man with the knife to no avail. The murderer explained that he was seeking aliens and knew he had caught his prey when they bled green! The officer proceeded to arrest him but stopped when he saw the bottle of alcohol. The murderer and the officer, who confided that he was a member of the FBI, ASIO, the CIA and a number of other agencies he had lost count of, proceeded to roll the body under their feet and use it as a foot stool while they drank and chatted. The fourth actor, a homeless and poor person, came in to join them, putting his feet on the body as well. When they finished the first bottle he revealed a second bottle of his own which he shared with the others. The scene ended with a mad man, a police man and a tramp convivially drinking over the dead body.

On talking to the group afterwards (LL1) (LL5), I asked them if they were aware of what the scene conveyed symbolically. That the “law”, the “criminally insane” and the “dispossessed” were equally unconcerned with death, even connived in it, and had a great deal in common. One of the boys said, “Oh you mean like a cartoon, where the figures are exaggerated and it’s having a go at something.” This insight linked what was already known to a new and abstract concept (LEX1) (LC1). It was arrived at through language but based on images (LI2) which the class had generated cooperatively (CCO) through humour (LE1).

We went on to talk about humour too which also has two ideas going on at the same time but to make us laugh (LL5). Its duality is like symbol. The two are usually found together in cartoons. Their success depends on the audience's ability to recognise the symbol and its relationship with the reality being described or commented on.

Another group's ability to symbolise was equally acute but quite different – almost surreal. Their characters derived from costume were a train driver, an emu farmer and a fisherman. These three also met at the bus stop and established who they were in terms of voice, conversation and behaviour. However, when they moved from the bench to the anonymity and silence of a lift, they became their characters in a symbolic way. The fisherman repeatedly opened his mouth like a fish; the train driver drove his imaginary train and the emu farmer strutted with beak and tail feathers made by his arms bent in front and behind. They circled each other like this in silence until the lift stopped with a jerk. They then returned to their natural human forms and had a conversation about the lift's unexpected stop.

This scene was not only dramatic and funny but also, we thought, symbolised the notion that we acquire the characteristics of what we work and live with (LL4) (CM). It represented our essence which we become in silence.

Comments (social, creative and learning elements).

The ultimate crystallisation of meaning is symbol, being able to see things symbolically and create symbols to communicate are central not only to the arts but also the sciences, Chapter 2 (p. 54) (Greenfield 2003), Chapter 3 (p. 80) (Greenfield 2001). They are not automatically acquired but need some nurture Chapter 3 (p. 93) (Blakemore & Frith 2005). Language itself is symbolic. Sounds represent meaning. Signs convey meaning. The fusion of language and thought make and handle meaning symbolically.

The brain's ability to handle two images or ideas at once, which is what we do when we understand or create symbol, irony or satire; to weigh one against the other; to connect (LC1) them, is a cognitive characteristic emphasised by psychologists Chapter 2 (p. 64) (Greenfield 2004). It is a mature and necessary acquisition for the development of understanding and further learning.

The students achieved this abstract learning through creating and transforming people within their own culture.

5.2.6 Stereotype (Year 10, drama lesson, drama room, term 4, 2003).

Description (as participant observer).

A Year 10 class had been investigating love and sexuality (LL1) (LL4) (LC1) (LL5) (their choice) (CP) through drama. Many facets were discussed, acted out (CPR) and considered, amongst them homosexuality and homophobia. There was strong homophobic prejudice from three boys in particular.

The task I set was to devise in groups of three a short enactment that represented (CM) or made a statement about homosexuality. The statements which were taken from the students' discussion were (LE2): 'homosexual prejudice excludes'; 'homosexual taunts hurt'; 'discrimination leads to death'; 'homosexuals should live separately' (apartheid).

While these statements were further considered and gave rise to more and deeper discussion (LL1), it was the acting of the three "prejudiced" boys that was most interesting. Each chose to play the homosexual character (LE3). One played the homosexually taunted boy who killed himself. Another played a man in a gay relationship with subtlety. The last acted a rejected gay man really movingly and sensitively. This learning had a strong emotional base (CEM) and commitment for both actors and audience ((LE4) (LE6). It provided a particularly acute social and cultural change of view to the three boys and extended the understanding of the others.

Comments (social, creative and learning elements).

Creating characters through understanding their motivations, perceptions, actions and knowledge; exploring their feelings and what it is like to be them, rather than accepting a stereotype, makes for good acting but is also a way of developing more critical and

empathetic views. Creativity needs empathy. You have to feel with or for your creation. It is not a manipulation of symbols or parts without emotional commitment.

This dimension of creativity can provide insight or change the attitude of the portrayer and the spectators. More generally this may be interpreted as indicative of the personally and socially transformative power of creativity.

This empathy, or shared powerful feeling, is discussed at length in Chapter 2 in relation to the role of ‘as if’ work in teaching, (pp. 61-62) (Blakemore & Frith 2005). Its effect can be far reaching not only in the emotional domain but also in the rational, which according to Damasio are strongly connected. Feelings can affect decision making and opinions (p. 60) (Damasio 2006). The work of Berthold Brecht and Augusto Boal has sought, in different ways, to affect audiences through, respectively, ‘alienation’, the emotional distancing of the audience (Brecht 1964, pp. 91-100) and physical involvement to change passive spectators into active transformers of the dramatic action (Boal 1979, p. 122).

It is significant that this example of creativity came through a designed, and repeatable, educational process. This was discussion of an issue, collective selection of key statements made, enactment of these, interpretation and discussion.

This exploration and creation was carried out within a social context where homophobia was particularly prominent in relation to personal sexual development, cultural discrimination and exclusion. It could occur in relation to ‘the old’, to ‘bludgers’ or any of the stereotypic presentations in our society.

5.2.7 Calling up the image (Year 10, drama lesson, drama room, term 1, 2003).

Description (as participant observer).

With another Year 10 drama class making plays about war, we began with one image of war from each student in the circle, “memory and retrieval” or “imaging” (LI2). The images were largely from cinema and TV, what Freire called “dialogue with the outside

world”. There was no alternative since no student had ever experienced war. They included bombs and explosives, breaking the news of war, death and loss.

This led to long discussions (LL1) about wars both past and present from class members (LE3).

The improvised plays produced (CPR) all transformed the talking and imaging into new creations (CP) (CT). They had generated new “meaning” (CM) (CO). The one I found most powerful and moving was the ordinary pub scene (in London in 1940) where, when the bomb dropped and chaos ensued, accompanied by the radio commentary of the necessity of war, all the two remaining pub goers could say was, ”Where’s it all gone – all gone?”

Comments (social, creative and learning elements).

The mention of Freire refers to his practice of understanding the world with people in learning circles by considering material objects from a culture in a critical way and is discussed in Chapter 3 (p. 99) (Freire 1987). The students, drawing upon cultural products in an effort to try to understand the war, were making a similar attempt at understanding the world critically by studying its manifestations. For students who have never experienced war this is a strong example of the brain’s ability to create, to feel and to learn the consequences of war through its own manipulation of perceptions and symbols.

As noted in Chapter 2 (p. 55) (Damasio 2006), the brain “thinks” in images and finds words to express the images to self and others. The continuous interplay of external and internal imagery and making meaning from them is one of the most important and unique powers of the human brain. Calling up the image is therefore made explicit in creative teaching. Time is given for it to be done and then shared.

5.2.8 Imagery from costume (Year 9, drama lesson, drama room, term 3, 2004).

Description (as participant observer).

Costume and parts of costume often create an image throughout media and may also symbolise it. This lesson sought to address this skill and understanding (CP) (CPR).

With a piece of purple satin cloth placed under a cap, a student walked into a scene and announced, 'I was not killed but concussed. I went to the Foreign Legion and now I have returned in time to....' The French accent was important to this characterisation but it was the head gear, the military cap, (the kepi) that really nailed it. The 'semantic transformation' (CM) was created through the combination of the separate elements of speech and costume (CIM) (CT) (LE1).

With a tie permanently knotted at half mast, a loose fitting suit jacket and old fashioned man's hat, the character of a modern day 'rake' 'philanderer' 'middle aged sleaze' was unmistakable – the walk and the whistling helped as did the voice but the tie in particular led to the particular characterisation most strongly, a 'percept' generated by movement, sound and costume (CIM) (CT) (CM) (LE1).

With a felt hat brim turned down all the way round, glasses, a pillow tucked into a T shirt and cushions in the shorts, the character of the one time surf life saver gone to seed was established. Again the voice and gesture helped but it was the outfit that created the stereotype (CIM) (CT) (CM) (LE1).

Comments (social, creative and learning elements).

What is the significance of this in learning? Firstly, it is a powerful way in to a character and situations can then be realised and discussed, analysed and considered in terms of drama, real life and culture (LEX1).

Secondly, it may help the identifying, categorising, generalising power of the brain as a processor and as a sorter. It has the appearance of what Torey describes as mental

manipulation of the experiential flow of thought, focusing and switching, connecting and speech (Torey 1999, p. 132).

5.2.9 Learning culture (Year 10, drama lesson, drama room, years 11 and 12, drama room and school hall, term 1, 2002).

Description (as participant observer).

The characteristics of creativity and learning are, not surprisingly, apparent in most drama lessons and usually lead to successful outcomes. However, there are also occasions when creativity and learning are not fully achieved and there is less or no success. Such times serve as jolts for the reflective classroom teacher and are important in the ongoing improvement of successful learning and teaching.

One such example highlights the importance of the learning culture established in creative teaching. The culture of a drama lesson is positive, celebratory, joyful, non-threatening and so on. These are all characteristics of the cooperation and respect needed for production and risk taking.

In Year 10 drama such a culture, having become the custom and practice of the group, was shattered by a perceived put down by a visiting student teacher. Inadvertently, in discussion, the student teacher referred to “fat chicks” and the term was perceived to be addressed to an overweight female student.

The group temporarily broke up, splintered and fractured. No creativity or learning was possible until after support and comfort had been given, anger expressed and discussion held. Only in this way could the insult not only be relieved but lead to new understandings and greater bonding.

This occurrence may also show that there were threats from within the group, otherwise the reference to “fat-chicks” might not have been taken in the way it was. The reference was a trigger. There were certainly some issues in the group in relation to the particular overweight student. It could be argued that an opportunity existed here for further creative learning by asking the group why they reacted the way they did. The class

could have reenacted the incident to see how their feelings changed, as they did in the case of the three boys reacting against homosexuality described earlier in this chapter in section 5.2.6 'Symbol and stereotype' (p. 139).

However, the difference between the two incidents was that one was seen as a personal attack by a pre-service teacher and the other a self-chosen issue being explored for understanding and acting purposes. The emotion in the former incident was much too high to revisit immediately. Time was needed for reflection and incubation. At a later date body image could be discussed and acted out, at a distance from this particular incident, as it was in section 5.2.3 'A life issue' (p. 132).

Another example, in the same term, produced a similar rupture in the learning culture and affected the whole class directly. The task was to improvise a scene depicting an anti-Vietnam war demonstration in Australia in 1971, as an extension of a production of the play "Cosi". The teacher was a 44 year old student- teacher. The class was Year 11 and 12 students.

The student-teacher told them what to do. He behaved as a stereotypic director and commanded them from the back of the hall. He also demeaned their ability. The things he chose for them to act were superficial – holding hands, singing "No nukes" and chanting other slogans. The result was that the students did not wish to show it to me, their teacher. Two students asked to drop out of the drama course after being actors for four years.

To recover I did the extension scene with them again. I asked the group if there was anything each of them felt strongly enough about to protest it publicly – to hold a banner up about it.

I gave an example from my own experience, as a story (LL3), of my own first demonstration against education cuts. I told them about the recent blocking of an industrial wine crush in a nearby country location brought about by community action. I included the fact that two of the current class had been involved – dropping leaflets and attending the mass meeting.

Only then did I ask two members of the class, whom I felt confident about, to answer the question. One said he would hold a placard for the environment; the other to keep music live (LE4).

It would have been easy from there to travel the imaginative road to us all holding our banners for what we believed in and improvise being stopped from doing so ... and so on. It was too early to follow this up at this time because of the recent humiliating experience although it was done later and appeared in our production of "Cosi".

Comments (social, creative and learning elements).

The above section exemplifies maintaining a learning culture when it is disrupted and raises the question at what point students become able to do this themselves without the teacher having to do it, or at least initiate it. Such intervention needs group cooperation, trust in each other and confidence in their ability to make decisions independent of the teacher.

These qualities do emerge, especially in activities where the product is of such importance that obstacles have to be overcome. Students frequently work together to achieve success whether the problems are material or personal. Examples of this learning culture can be seen in the description of working towards play production in section 5.3 'Performance' (pp. 151-165). The need for teacher intervention in the above examples was necessary because they involved another teacher, in relation to whom the students felt powerless.

The reason for the near failure when the students would not show me what they had created and some wanted to leave drama was also that the act of creation; the hermeneutics, requires the involvement of the intellect and the emotions at once as well as the gathering together of the relevant experiences, narrative and genuine commitment to the idea (Kincheloe 2003, pp. 20-21).

The break with a creative learning culture which is one of cooperation, trust and valuing between participants certainly mattered. There would have been serious consequences had it not been repaired. Practically, had the work not been made up for, it would have

been an opportunity missed to enlarge the actors' and audience's understanding of the play.

Educationally, the students would have missed out on learning an important educational lesson: that it is possible to take action in the world against injustice and succeed. For many this would have been a new perspective and experience given that "activism" is a derogatory term for protest in this local culture.

The problems, difficulties and failures described in this section are not isolated examples. It is frequently the case that a teacher falls below his or her expectations. This can happen when there is no familiarity with the class, when the teacher has not had the opportunity to build trust and relationships which may take a protracted length of time. There are often disruptions and distractions from within and without the classroom. The inappropriateness of the environment, on many occasions out of the teachers' hands, can also be a major negative influence

However, it has been my experience that where the elements of engagement, purpose and product exist along side trusting relationships there will be successful outcomes. There can be degrees of success even when the conditions are not optimal. In fact, this may well occur in the initial stages of students experiencing a different pedagogy.

5.2.10 Engagement (Year 10, drama lesson, drama room, term 1, 2005).

Description (as participant observer).

There can be lack of engagement or commitment in drama lessons. Two examples are the three girls who took their small group out of the back door and ate their lunch sitting in the sun and the small group that talked about personal issues unconnected to the task. Such lack of commitment even manifested itself on two occasions when students arrived to perform publicly after cannabis use leading to a "judge" in role laughing and a "naval captain" swearing.

More difficult is the failure of a teacher's pedagogy with a whole group. Such was the case when, after several years of success, the inclusion of a short, and usually popular,

scene from Shakespeare's "Romeo and Juliet" was shunned totally by a large group of boys. They said, 'Drama's not fun anymore like it was in Year 9!' At that stage of drama I had been able to create activities appropriate to this group of boys and cast them acceptably in the Year 9 "Traveling Road Show". However, in the Year 10 drama course there are some skills and capabilities which are challenging, new and necessary to develop as a performer, spectator and critic of plays. For this group, unlike many similar ones, these abilities could not be countenanced within their current school cultural identity.

Despite discussion and support the boys finally asked to be moved to "technical studies" and I agreed. The only difference I can perceive between this and many other similar groups of Year 10 boys, all of whom had striven hard with the language and the acting and succeeded with much admiration from the class, was a strong group dynamic and a group leader who was solidly opposed to the activity, possibly out of fear of losing face.

Under the umbrella of engagement too falls the boy who could do well in drama lessons in Year 9 but not in Year 10 where you do need to be able to read. A very generous girl playing opposite him in the scripted play learned his lines too and prompted him in character but still the play was slowed and the boy took every opportunity to disrupt the whole process. His engagement was limited by his inability to read and, unlike an earlier student I had who painstakingly learned all the lines of a play by listening to me saying them over and over again during lunch hours and eventually becoming a reader, this student could not be taught. The school provided one on one tutoring but it was too late; he could not admit to not being able to read or needing special tuition.

Educationally, the particular *form* of creative learning, in this instance Year 10 drama, has prior learning preconditions. A *creative* writer needs first to be able to write. What happened in the examples above may not be a failure in *creative pedagogy* but rather shows that creativity cannot occur without some *form*. It is never abstract. To be creative within the form, you need to some extent to be competent in that form and to increase creativity you need competence in the appropriate domain, as we have seen in the research literature, Chapter 1 (p. 17) (Nickerson 1999).

A last example of lack of engagement, which prevents all of the other characteristics of creativity and learning from working, was the presence of a student in the class with Asperger's Syndrome. The characteristics of her condition left us wondering what would happen as she proceeded through the course. We anticipated that her inability to imagine or pretend would be a barrier indeed.

Not unexpectedly the individual work went well, the group improvisation too mainly because various students volunteered to have her in their groups (CCO) (LE5). Her disability made a group play a difficulty because of the amount of giving and taking and sharing required. Eventually, she came unstuck in two ways which throw light on the creative process:

Firstly, during one rehearsal she claimed "harassment" by another student in the wings and did not take part in the eventual performance. Secondly, she acted in a final group improvisation successfully (CPR) but because I had singled out one of the plays for a performance to another class because of its content relevant to a "Health" lesson, she stood up, shouted and screamed that she wanted to be in THAT play and that she only got to be in "silly" ones.

Both these reactions are I think because of her disability; she seemed to be trapped in the egocentrism of the young brain (Piaget 1967). She seemed to see the world from a single point of view without awareness of other perspectives. She could not see these activities as collective and cooperative but rather individual and competitive.

It is these activities that the other students were learning and becoming accomplished at. They are the preconditions for participating in the relevant form of learning. They are also aspects of maturity both emotionally and cognitively.

Comments (social, creative and learning elements).

Such examples, as has been said, are important because they jolt the reflective teacher into further thinking about theory and practice.

The example of the disinclination of the boys may be symptomatic of some elements of youth culture where peer groups form a resistance across the curriculum to engagement in any learning which challenges their cultural confidence. There are many studies of peer pressure and youth culture, among them (Brown et al. 1986; James & Wearing 1985; Pilkington 2006) where its continued prominence is researched, the varying roles it plays and the possibility that it is less important in today's society. However, the research of Willis, in particular, is relevant and helpful here. In his book "Learning to labour: how working class kids get working class jobs", the boys saw manual work as superior to mental work and actively failed themselves academically by developing cultures of resistance in opposition to schooling (Willis 1977). Interestingly, for the boys in my example, it was technical studies which they chose to move to.

This phenomenon is one of the reasons why raising confidence is such an important aspect of drama lessons and also why we often discuss and make up plays about this kind of 'gang' behaviour in order to understand it socially and culturally. It is often insoluble within a single lesson or whole course despite attempts to find common ground or reframe the curriculum and may have to be handled structurally by the school such as dispersing the group for lessons. It can become an issue at whole school administration and policy level. However, Willis is of the opinion that such alienation cannot be solved by internal school management because it is not caused by the particular practices of schools but by the location of schools in the class structure. However, despite this example, I have observed multiple instances where similar class based students are able to change and develop through the practice of confidence and criticism as part of their learning at school. Two of these feature in my seven longitudinal student biographies, Appendix (3).

The case of the student who steadfastly refused to learn to read in Year 10, despite the support provided, is obviously very serious. I have talked about the importance of reading for learning and creativity in Chapter 3 (pp. 94-95) (Blakemore & Frith 2005) and there is a plethora of excellent books, studies and even the novel "The Reader" by Bernhard Schlink which contribute to our understanding. One of the especially relevant studies for this situation is that of Badger (2003, pp. 125-135) where we follow the history of Craig, a one-time reluctant reader and non-writer for and with whom a learning pathway was built to success in school literacy. This took place in primary

school. A significant difference was in terms of brain development and the social implications of illiteracy at fifteen years old.

These elements of lessons recorded in my notes demonstrate that without the engagement of students in learning, their willingness to be actively involved, there is little development intellectually, socially or emotionally. This lack of involvement may sometimes be as passive onlookers or sometimes as active players of their own agenda: the disruption of the class. The disengagement described here springs from socio-cultural factors as well as psychological ones.

These incidents also point to the crucial importance of commitment to the dramatic production and the priority it needs to have in drama lessons. This can be learned through discussion and understanding of the reasons for disengagement or disruption, and what they mean for others involved in the group endeavour. If successful, the learning is important for all the students in the class and not just for drama lessons but for other aspects of their growing maturity.

5.2.11 Confidence (Year 9, drama lesson, drama room, drama schools' tour, term 4, 2002).

Description (as participant observer).

One occasion, when failure was a close call, was the boy playing the emperor in 'The Emperor's New Clothes' for an audience at a nearby school. He had never quite got as far as standing in underclothes and socks even in rehearsal. This moment was the crux of the whole play. It was meant to be hilarious. Even the principal's request to do it, at the final rehearsal in the drama room, was greeted with a barrage of swearing.

The moment came on tour at the first primary school; the piano played to a rising crescendo for what seemed like hours, and he did it - to tumultuous applause (CPR). From then on he added extra funny touches at every performance, confident and proud at last (LE1).

Comments (creative, social and learning elements).

Although previous examples, above, of failure, or near so, emanated from a lack of engagement for various reasons, another primary characteristic which affects success is confidence Chapter 1 (p. 18) (Freeman 1983). Building confidence is vital every step of the way for creativity and product to occur. It also grows when a first successful step is made. Teacher persistence and belief is really needed.

Again, the reasons for needing to grow in confidence are culturally and socially related. On this occasion, for a fourteen year old boy, it was 'looking stupid' in only your underwear in front of large audiences. On another occasion, in the same play, it was line dancing. Both underwent change, the first when it was seen in the context of a traditional children's story and the second when it became known that the play was set in the country. The latter became so popular with all audiences that the whole class, predominantly boys, insisted on being in it and claimed it as the best part of the play.

5.3 Performance.

It may seem odd to include "performance" as a learning activity separate from "drama lessons". However, just as mathematics and science are considered separate in many ways and yet constantly interweave, so too do the improvisation of drama lessons and the interpretation and performance of a scripted play. Mathematics is the quantifiable basis for science and improvisation is the foundation for play performance.

The difference between major productions of published plays and an improvised play, or a group demonstration in science or a group devised piece in English is essentially the length of time taken (for a major dramatic production usually six months of in and out of school hours work), the size of the audience and the status of the event.

This appears to increase the learning and the creativity. It is also an activity with inherent personal danger which takes nerve to do. Consequently, success results in a sense of satisfaction so profound that students recall these productions in literal detail many years later. What they learned and the abilities they developed through the

experience also seem strong as can be seen in their observations and answers to questionnaires discussed later.

5.3.1 Group created scripted play (Year 9, drama lessons, drama room, drama tour, term 4, 2002).

Description (as participant observer).

The twenty four Year 9s had chosen (CP) the drama course where the teacher writes a “Traveling Road Show” for them to perform to Reception to Year 7 audiences in the neighbouring schools (CPR).

The teacher’s mind was “tabula rasa” except that the show would be a version of “The Emperor’s New Clothes” story. The first activity was to talk in a circle (LL1) about the product. The students were asked to produce in groups something that could be part of a “court entertainment” scene with no holds barred (CCO).

The room becomes an apparent madhouse as students talk, argue, try out and get excited about their learning (LE7). They try on clothes or choose a bit of cloth or find objects and transform them into amazing things (CT). A small piece of green velvet draped over shoulders makes a king; a wooden drum stick becomes a feather in a tricorne hat.

Each snippet of entertainment is shown (CO). They vary from juggling to acrobatics to a magic show. They range from sawing people in half, to a Monty Python type script, to stand up jokes, to slapstick. They were bringing together disparate elements and reassembling them in new ways (CT). Each was talked about after it was shown. Through discussion, the group reflected (LL5) on how they could be incorporated into the play and how they could be polished (LE3). Most of them were eventually written into the play.

In the next lesson, to understand what the story was about and be able to convey that to an audience, we needed to make some connections (LEX1) (LC1) with our own lives and experiences. We needed to be able to collect these and, together with the events of the play, reach a generalisation about the play’s theme or themes (CM).

“The Emperor’s New Clothes” is essentially about self importance, credulity and deception - being “conned”. In the circle we each provided examples of being deceived from real life (LEX1). We collected the qualities of “con” merchants, types of confidence tricks and in groups enacted one. They varied from emptying a house on a bogus authority to an old lady who conned the “conners”; from a bank card deception to buying a crocodile. There were also clothes scams (LL3). The first of these was scripted into the play and the other enactments helped with characterisation, movement and appearance.

Using the same process we examined “Rich and Poor” because the emperor’s self-importance obviously derives from his position and his possessions. We had lots of examples of behaviour, voices and exploitation (LI3). In a stunning symbolic (CM) act one girl literally swept away the poor! While none of these were used in the play, they were useful for the discussion of mannerisms and bearing and most importantly for the establishment of a generalisation about wealth that included examples of class exploitation.

The process for the teacher was also one referred to in the traditional definition of creativity, that of “incubating” after much collective discussion and experimentation, to individually create the product. One morning in ten minutes lying in bed I just saw the play’s images in front of my eyes. I went and typed it out, with the students mostly cast in their parts too.

This improvisation and creativity continued to occur throughout the rehearsal period. However, the most significant galvaniser of creativity was the audience and the final product (CPR). Not only did creativity occur at this time but it did so exponentially as confidence (LE4) grew until it climaxed in the last two performances. By this time over a thousand children had seen the traveling show.

Examples of additional creativity abound: the emperor fell off his sedan chair; he was determined to punish the culprit who had been carrying him. In rehearsal and in the script this had been a throwaway line of intent to “get him”. In performance this developed into a full on dialogue between hundreds of children and the emperor as to

where the culprit had gone! “He’s over there –where? – Behind you – I can’t see him,” and so on.

The shedding of the clothes behind a screen was transformed from an initial quickly thrown cloak over the screen to the long and slowly climaxing appearance of one garment after the other backed by accelerating band music until the emperor was revealed in boxer shorts, crown and boots – on the last night red and white football socks had been added. None of this came from the teacher but from the actors’ discussion (LL1) and planning to make the show funnier (LE1) in a variety of ways.

Comments (social, creative and learning elements).

Performance and product were responsible for high levels of creativity, thinking, acting and doing. Language, symbol, reflecting and creating cooperatively were present throughout the process.

Particular mention was made in the journal reflection of the ability for **all** of the students to take part in the early transformations in this process (making up elements for the “court entertainment”), an example of “quantitative” creativity defined by Cropley (2001) and discussed in Chapter 1 (p. 7). The large quantity of those ideas as well as their variety illustrates Guilford’s point (1950) that creativity needs both fluency and flexibility Chapter 1 (pp. 13, 14).

The recollection of the way in which the play was finally written demonstrates Wallas’s stages of “incubation” and “illumination” graphically; the play and its characters appeared like a vision in the mind’s eye. Some creators would have seen this as the prompting of the “muse” or “daemon”! This is discussed in Chapter 1 (p. 9) (Jeffrey 1992) and (p.11) (Wallas (1926).

Humour is an underlying and ongoing trait of drama lessons, rehearsals and performances. It binds us, excites us and eases tensions. On this occasion, we were also trying to create something humorous for others so humour became not just part of the drama fabric but its purpose. The research literature discussed in Chapter 1 (p. 14) (Getzels & Jackson 1962) rates playfulness, risk-taking and confidence highly in the

sets of characteristics to be found in the very creative. Humour was a high ranking feature in their productivity and they also rated it highly in importance themselves.

A link can also be made with brain development. The students have practised, through creating and understanding humour, the ability to handle two ideas at once in comparison and contrast, always a requirement in humour whether it be farce, comedy of manners, irony or satire and certainly a characteristic of creativity Chapter 1 (p. 15) (Koestler 1964) and more complex thinking Chapter 2 (p. 48) (Blakemore & Frith 2005).

Furthermore, humour, along with an array of other emotions, particularly empathy, is an important part of learning and brain function. Both Damasio (2006) and Pert (1999) emphasise, as was discussed in Chapter 2 (p. 45) what they see as the indissoluble link between thinking and feeling.

In social terms the students were able to cooperate with other Year 9 students without issue. They had come from a Year 9 cohort of four classes, having chosen to do the acting component of the ‘Traveling Road Show’ rather than the musical, technical or publicity and promotion elements of the project and as a result were not in their regular class. All the classes combined from time to time during the process and at the end for the final product. They had entertained the various year levels of children in the audiences in the neighbouring schools. They had carried the responsibility of their school’s reputation as they appeared in its primary feeder schools. They had become more confident not only as actors but, overall, as students in the school and local community.

5.3.2 Preparation lessons for “Dimboola” (Years 11&12, drama lessons, school hall, term 2, 2003).

Description (as participant observer).

The obvious first question, in relation to the play “Dimboola” by Jack Hibberd, was how to recreate a wedding that took place in 1969 in 2003. It was also a question that was going to need transformation (CT) of place and space, the creation of character and

costume (CO) and, as always with script, the transformation(CT) of the printed symbol (LL7) (CM) or word to the spoken acted word and thence to the audience's reflective interpretation (LL5).

We were lucky to have a wedding photographer and a wedding musician on the school staff. Both addressed the actors and production crew (the Year 11 and 12 drama class) on what they had observed over the years at weddings, differentiating between "ethnic" Australian weddings and also country ones. Their talks were rich with detail as well as vividly creating atmospheres (LL1).

The students wrote up summaries of what the two had said (LL6) and I also asked them to refer any of the illustrations or detail to our play to enrich and enhance it. The result was a very creative one indeed. There were seventeen suggestions, all of which were able to be incorporated (LC1).

Through this opportunity to be creative for a purpose (CP), the students had not only become genuine participants in the creation of the play but had also engaged (LE3) with culture and history in a practical and meaningful way. They had entered into abstract discussion of "icons", of traditions and of the economics and value of these functions, analysing and synthesising what they had learned (LC1) (LL4).

One of our history teachers also talked to the class about the history of Ireland. This was vital since, although set in Australia, the play does not refer to contemporary Australian politics but to Irish political and religious history and conflict. The students did not know the significance of the green and the orange or the meaning of "protestant" (CM).

The teacher arrived with a large white, orange and green Irish flag (CM). It was a good place to start. This was quickly followed by the "Irish" joke and the history unraveled from there. Again the students were asked to summarise what had been said in writing (LL6), but this time to associate that with any of the sectarian interchanges in the play; to imbue them with some intense feeling (LC1).

Interestingly, the summaries showed that there had been fairly superficial understanding. There were some major errors such as “the Battle of the Boyne in 1960” and “women in orange” rather than “William of Orange”. As I expected, the real understanding began to come when we examined the text and interpreted it in relation to what we had learned (LC1) (CM). For instance, firstly, calling the character Aggie an “old crow” is not an Irish put down while saying somebody “pisses purple” is. The characters Bayonet and Mutton are not part of the sectarian mutual abuse because they refer to “all” religions being similarly unacceptable and are equally insulting about Catholic and Protestant.

Another aspect of the production of ‘Dimboola’ which had to be understood in order to be recreated was the place in which the wedding was set and would be performed. We had to transform (CT) our cream brick, school hall into a municipal hall. Conceptually, we would learn about the role of public buildings in cultural tradition (LEX1).

The stage management group traveled after school one evening to a nearby village hall at Littlehampton (CCO). As a result the students suggested how we should decorate our own school hall to resemble the municipal hall. We would need photographs of war heroes, a war honour board, a large country clock, a picture of the Queen and an overall timber effect (CIM) (CO) (CPR). They also learned the history of Littlehampton in a practical way (LEX1). They found out that a large number of young people died in both wars. They discovered the place of patriotism and the Queen of England and, sociologically, the role of the “village hall” which even now is in constant use.

Comments (social creative and learning elements).

Overall, through the production process, the students were able to relate an abstract concept to something concrete and vice versa. The trigger for this important thinking process was that they had to understand the concepts for the sake of enacting the play, for real, in front of an audience. As we collected examples of the concept then other examples could continue to grow and be understood, strengthening the concept at the same time. It was a good example of the “coat hanger effect”, where concrete experiences are assembled under the umbrella of an abstract generalisation Chapter 2 (p.

64) (Greenfield 2001; Torey 1999), but it also gave depth and understanding to the product which in this case was the play.

In Chapter 2 (p. 48) the research of Blakemore and Frith (2005) is discussed in relation to the importance of questioning. In the preparatory stages of performing “Dimboola” the questions are being asked by the students of the teachers and have a genuine purpose. Blakemore and Frith’s view is that such questions lead to the formation of new neuronal connections and different kinds of thought processes unlike solutions provided by the teacher. In Chapter 1 (p. 15) Runco and Sacamoto (1999) also conclude that problem posing and finding lead to creative insights.

The process recalled in the reflection refers to a number of times when new knowledge is arrived at through prior knowledge, such as current ideas and experiences of weddings expanded to the new kinds described by the visiting photographer; such as experience of local halls extended to their significance in local history by the visit to Littlehampton. This learning based on prior knowledge is part of the initial definition of learning in Chapter 2 (p. 32) (Mayer 2008) and is also a constructivist view.

The preparation process was a clear example of the difference between active and passive learning and, to use Paulo Freire’s metaphor, critical and creative thinking as opposed to the futility of the banking system of education (Freire 1972). In this case, what had been deposited had to be withdrawn and used to be learned.

What was learned in this activity was creatively and practically transformed into the presentation of the play. It was a complex and lasting way of learning which also went beyond the play.

In social terms the play was about a social construct and social relationships in another culture – an Irish wedding in Australia in the 1970s. It also brought into contrast and comparison the students’ own culture in respect of these central human concerns through discussion.

5.3.3 Part of the process “White with Wire Wheels” (Year11, drama lessons, drama room, term 4, 2005).

Description (as participant observer).

The Year 11 all male drama class chose, after reading a variety of possible scripts (LL7), to research, rehearse and perform Scene 1 from “White with Wire Wheels” by Jack Hibberd (CP) (CPR) (CCO). This first scene introduces three young Australian men sharing a flat in the 1970s. It is 8.30 in the morning just before they go to work. As they talk, their interests and attitudes are revealed through vivid verbal exchanges and comedy. They are above all seeking to prove themselves to each other as “macho” men. They are sexist; they get drunk; they love cars. All their exploits are exaggerated.

From the start, the boys revelled in the humour (LE1) and strongly identified with the characters. Talking to them critically about sexism and stereotypes just skidded off them (LL1).

After little progress with conceptual understanding of a culture being satirised in a play (CM), despite reading about it and listening to teacher talk about it, I decided to try working through the concrete and using the pupils’ language. The language references needed to become the coats on the hanger of the concept.

The “coats” on this “hanger” were increased a little when the boys wrote the first page of the scene as if they were female (CO). The “car” and “porn” images in magazines became “fashion” and “studs”; the exploits became the allurements of men, although they became less graphic and more emotional or sensitive, and drinking was similarly exaggerated.

In an effort to gain deeper understanding than just this male to female exchange of stereotypes, I asked them to do the same scene but with the boys bragging about sport in a funny way (CO) (LE1). I left the room while they devised this improvisation. They included reports of a cricket game, a football match and a golf tournament (CCO). Each was described vividly with great humour (LE1) (as were the exploits in the original

scene) and exaggerated to the surreal, like some Monty Python sketches, especially the four Yorkshire men (LE7).

Only then did the actors/students see what was happening in the interactions of the original play; the characters were competing through exaggeration and lies to be the most “cool”, “macho” man.

The next step was to understand that it derived from a specific Australian culture and to consider the implications (CM). Did we think that if sport were treated in this way it was inoffensive but when women, as in the original scene, were it was problematic? In writing (LL6) and talking (LL1) the students eventually reached the conclusion that the attitudes did matter when the subject was women. They thought it would “affect women’s lives”, their “esteem” and their relationships with the boys themselves. They too would be affected.

Comments (social, creative and learning elements).

Gradually, we came to see how culture is created and supported through the media (the magazines in the play), and social learning (the continuation of societal assumptions through peer reinforcement in the play). This was a significant “coat hanger” in understanding the world in which we live.

Most instrumental in this learning journey were language, creation and humour. The boys talked their way into understanding ‘felt their way into a meaning’ (Dixon, 1974 pp. 242-247) at every juncture of the process. The talk derived from each of the transformations they were asked to do: first interpreting the characters, movement and set from the actual script, secondly making the characters female with all the changes that involved, and thirdly making the subject of the discussion sport not women. This entailed talking about all the cultural indicators: clothes, living arrangements, dialect, sex, violence and so on. As usual with drama, the performance prevented such discussion being casual because each element had to ring true for the play to be convincing to an audience. However, it was creating humour and having fun doing so which really took their understanding, abilities and performance to the high level that was achieved.

This collection of attributes: language, creation, humour, authenticity, interpretation and transformation have been referred to in previous comments on drama lessons and performances in the light of the research literature. Perhaps the most significant aspect of this activity, not already referred to, was the role of the teacher. Barnes (1976) referred to in Chapter 3 (p. 93) stated that the quality of the discussion is not determined solely by the ability of the pupils. The tasks, their familiarity with the subject matter (in this case especially knowing the play and selecting it as a possibility for their choice), building their confidence in themselves and the quality of the discussion, were all influenced by the teacher. And in the words of Freire and Giroux (1987) Chapter 3 (p. 93) in the learner-teacher and teacher-learner situation, the teacher can assert her own voice while still being able to encourage students to affirm, tell and retell their personal narratives by exercising their own voices. The activity breaks down the traditional barriers of teachers as it did here given the small size of the class and my long time acquaintance with the boys. Both gain insights.

This learning and creation of a new product was not instructive just to the students involved. Their first performance of the two scenes to a public audience brought so much acclaim that it was suggested that they transcribe their scene and send it to theatrical and media outlets. This was done in out of school time by painstaking transcription from the video recording. Every performance was improvised but by the end of the process the lines have been refined into those with best effect and become the “script”. They were also prevailed upon to do more performances thus making available their cultural and societal understandings through humour to a wider circle of people.

5.3.4 Learning in retrospect “The Crucible” (Years 11&12, drama lessons, school hall, term 2, 2005).

Description (as participant observer).

The performance of Arthur Miller’s play “The Crucible” called upon all of the qualities of creativity to accomplish a task of such artistic and dramatic complexity.

“The Crucible” is a play in four acts written by American playwright Arthur Miller in the 1950s. Its subject matter is the Salem (Massachusetts) witch trials of 1692 where 300 people were imprisoned and nineteen people hanged for the crime of ‘doing the devil’s work’. The play’s characters, language and narrative are enthralling and moving in their own right but additionally the play relates to serious moral issues across generations and time: those of truth and lies, power and corruption.

Shortly after the time of Miller’s writing the play, Senator Joe McCarthy conducted Senate hearings into people suspected of being Communists (mostly artists and entertainers) and sought the names of others from those arraigned. While none were hanged, several took their own lives and many never worked in entertainment again.

Whenever the play is produced there are parallels in the society of the time. Three such issues are: false confession to avoid death, naming suspects without due judicial process and speaking out against authority despite recrimination. On this occasion, in South Australia, there was the “naming” in the parliament of politicians for allegedly immoral acts. Everyone was also talking about the imprisonment of Schapelle Corby in Bali where the judicial process, the punishment and the ability to avoid death by confessing (whether true or not) were identical to those in the play.

At the national level, shortly before we began studying the play, we saw a number of army defence personnel speaking out against Australia’s involvement in the war in Iraq based on military advice that they believed was flawed. One of these, Andrew Wilkie, resigned rather than be implicated in what he saw as lies leading to unjust violence and war and as a consequence forfeited his professional career, his high salary and his family relationships. In a similar case in Britain, an officer committed suicide.

There are of course many other parallels in history and the world today where the role of authority is self-interested and great personal courage is required to stand against the prevailing unjust view.

These matters were investigated (LC1) (LL7) and discussed (LE1) by the students who needed to know about them and feel their way inside them (LE2) in order to properly act the play. In so doing, not only did they understand those examples from history and

the play deeply, they also enlarged their world knowledge. They developed their thinking ability (LL4); the connections they made allowed them to create a scaffold of meaning (CM) for generalisations about the concepts of “terror”, “power” and “courage” (CEM).

Like all learning the first necessity is to relate the subject matter of the play to the lives of the students, not only so that they can understand it in the light of their own experience but also so that they can build upon their existing knowledge and understanding (LEX1).

The play’s narrative (LL3) allows them to see a piece of life, a living excerpt of history which they can then interpret, relate to their own lives and generalise from.

Many of the comments after the play’s performance point to important areas of learning. Audience members referred to the self imposed discipline (LE3) by the group which emanates from their intention to do the play well (CP) (CPR). They also help each other during rehearsal and performance to enact the script perfectly. Cooperation (CCO), responsibility and selforganisation are demonstrated here. The stakes are high if they fail!

Most audience members remarked on how well the students acted out the “characters”. This is an important part of our preparation for the production. Auditions are held where students choose the parts they either most like or think they most suit. We then have numerous workshops where they behave as their character would in situations not in the play (LI3) (LE2). We spend time on how the characters speak in terms of regional, national and historical accent and also in terms of conveying emotion (LE2). We also examine and analyse, and then act, the relationships between the characters during the development of the play (CT). We imagine (CIM) pasts and futures for the characters too. This process incorporates the interpreting, relating, connecting, analysing and visualising components needed for play production (LC1). They are also key aspects of learning more generally.

Comments (social, creative and learning elements).

While drama lessons are creative in very many ways, it is the preparation for, and performance of, the play itself which incorporates, par excellence, not only creativity but many other essential processes in learning. These include interpreting, relating, connecting, analysing and visualising. It also promotes outcomes such as responsibility, cooperation, organisation, confidence and maturity in the students involved which are plainly social but also integrated with the learning and creativity. These connections were discussed in Chapter 2 (p. 74) referring to Andreasen's view (2006) that creativity and creative learning happen in cooperative and collaborative groups, and Murphy's (2005) observation that the success of the health community arts project related to, and gained validity from, the meaning made in the collaborative process.

This happens through the brain's ability to transform the black and white lines and dots which are written words into meaning. Drama students then have to visualise and enact this so that others can take meaning from their actions on the stage and in turn relate what they see to their own experience. Vygotsky's (1962) 'web of meaning' perfectly describes the connections and transformations through text, word and meaning that this process entails Chapter 3 (p. 93). The students' experience and interpretation also grows as they talk and think about what they have seen.

Reflection is essential to this process of 'student-centred, active learning approach focused on questioning, critical thinking and problem solving' Chapter 2 (p.41) (Savery 2006). It happens in an ongoing way, in actor to actor discussion and small group or whole class reflection usually in a circle. It makes time for a bridge between experience and learning to occur. In the circle everyone has the opportunity to speak, every idea is valued and the contributions to the learning are recognized. As we have seen in earlier drama lesson descriptions this process is structured and modeled by the teacher initially and grows over time in independence and complexity. Teacher and students reflect on the phenomenon before them and on the prior understandings which have been implicit (Schön 1983, p. 69).

Schön also points out that creativity requires the freedom to consider the "unthinkable" alternatives, to doubt the worth of "cherished practices" and this can happen in a circle

of reflection or brainstorm, Chapter 2 (p.38) (Osborn 1953). This relates to observations of the original, novel or divergent nature of creativity in Chapter 1 (p. 11) (Wallas 1926); (pp. 14-15) (Sternberg & O’Hara 1999; Cropley 2001). It also connects with the notion of single and double-loop learning, also referred to in Chapter 2 (p. 33) (Argyris & Schön 1974; Argyris 1990), where we can think outside conformity, come up with novel ideas and challenge the accepted and expected. This can extend to well-established frameworks or paradigms in our society. In preparing for this performance there was reflection on multiple issues and some double-loop thinking, including common assumptions about crime and punishment.

When the product of learning is live theatre with an audience, a number of consequences follow. It all has to be right there and then. There is no cushioning or blurring. It is very far from most school work. It is a risk taking event and needs courage but is an important characteristic of creativity, Chapter 1 (pp. 18-19) (Nickerson 1999) and Chapter 2 (pp. 71-72) (Harris 2006). The preparation and work beforehand is galvanised by this overshadowing reality that one night it will be on with all its perfections and any imperfections revealed for all to see.

It is this driver which pushes students to achieve well above their current ability. A teacher who viewed the final performance said, “It had rigour.” This is not a word which is often used to describe work done at school, nor is it a popular concept amongst students. It is, however, required in any serious academic or scientific endeavour in the world beyond school.

Having said this, it should not be forgotten that an important aspect of all this work is the change in students’ societal perception in terms of history and human activity. Their world view is enlarged.

5.4 English

Year 11 lessons, extracts from lessons and groups of lessons over short and long periods selected to show a variety the learning of subject relevant concepts and capabilities derived from the South Australian Certificate of Education (S.A.C.E.) curriculum.

5.4.1 Spin (Year 11 English lessons, term 3, 2003).

Description (as participant observer).

I have called the following example, ‘A journey through language to understanding: a change in cultural perception’. The subject was “Spin” and the class was Year 11 students.

It all began with the last chapter of “Animal Farm”. We had adopted a process of silent reading (LL7) and then students voicing anything that had struck them within the meaning of the story and its application outside – to the past, present or future. One student said ‘Lies - the lies that the pigs increasingly have to tell’. From this we talked as a class (LL1) about the lies apparent in our school context and then in the Iraq war. We asked whether there really were any weapons of mass destruction and so on (CP).

I thought it was time to watch the film “Wag the Dog” and see how “lies” can be either actual or manipulations of truth – “spin”. The film also demonstrates the power of media and technology in shaping people’s ideas in a shocking way. We saw the use of music, songs, images, words, (LI2) “show business” and power for political ends.

A long time of discussion followed (LL1) relating the film to real events. In a workshop, I provided some facts about Australia’s intervention force in the Solomon Islands at that time and asked the students in twos to write (LL6) and deliver the news item with spin on the side of the Australian Government (CO) (CPR).

They were all effective (LE3). Perhaps the most memorable was the one that introduced the spontaneous tribute of pineapples by the “natives” to the Australians representing their appreciation of the “Green and Gold” (CM)!

We then watched “Dark Side of the Moon” which is a different example of media manipulation; a documentary that seems true, convincing and genuine. We noted the editing of old footage and the use of imagery and authority figures to deceive (LL2).

Students had a range of topics related to spin to talk about for four minutes for their SACE stage 1 oral component (CPR). From this it was clear that they had learned to detach themselves critically from what they saw and heard in media and film – one even said, ‘Since “Wag the Dog” I never hear the news in the same way. When I hear ‘we are very, very, concerned’ I think they probably aren’t! It is still hard to detect the truth but at least now it’s an option.’ The students found this work exciting (LE7) and eagerly went on to bring fragments of media and ideas to the class for discussion. They seemed to be enjoying the world of concepts and ideas not just receiving them passively.

Comments (social, creative and learning elements).

In this series of lessons, many aspects of creative learning are present particularly transformation, reflection and generalisation enhanced by close attention to the written word. As Vygotsky (1962) said, generalised concepts come only with maturity at the advanced stage in the development of word meanings Chapter 2 (pp. 65-66). The written word with its potential for greater definition and refinement is more to the fore in English lessons than in dramatic improvisations and productions. The ‘mappings between symbol and speech’, Chapter 3 (p. 95) (Blakemore & Frith 2005) continue to be developed and represented in written language.

It appears that writing in English lessons promotes greater understanding and a better product when it is a creative transformation of a written genre rather than when it is a series of comparative notes. Making replicas of kinds of communications is better than just comparing them. The students develop greater skills in diverse writing styles and are thus able to be more critical of the genre. The product galvanises greater engagement. In Caines’ principles this is called ‘focused attention’ Chapter 2 (p. 36) (Caine & Caine 1994) and the NACCCE report points to ‘engaging’ possibility Chapter 2 (p. 73) (NACCCE 1999). Such writing includes purposeful discussion when done as cooperative group work. Often there is also overt emotion displayed, in this case, humour. Through this creative process the students also moved from the commonplace and the accepted social and cultural meanings attached to images and events to their political implications Chapter 3 (p. 92) (Freire 1972).

5.4.2 Imagery (Year 11 English lessons, term 3, 2004).

Description (as participant observer).

(This journal entry is the same English class but a year later).

We needed to understand the imagery of the playwright/film maker in one of the categories we were required to study for the South Australian Certificate of Education (S.A.C.E.) (CP).

Given my view that imagery in the brain is largely created and recreated through language, I decided to ask the Year 12 English class to recall images and consider them rather than create them; in other words ‘play the film backwards’! The film we had seen and greatly liked (“Marking Time” by John Doyle) was about the arrival of an adolescent Afghani girl and her refugee family into an Australian country town in 2000, the year of the Olympic Games in Sydney, the Tampa asylum seeker incident and the re-election of John Howard on a platform of opposition to the “illegal” immigration of “boat people”. What images did we remember from the film? What did they mean to us? Why did the playwright/film maker choose them? I thought the interplay of image-meaning-word would be interesting and educative as a way of looking at film and video.

The students all closed their eyes and recalled an image (LE3) (LI2). Each then told the class what it was; described it in words and then said what it meant LL5) (CM). The choices showed how well the imagery had been chosen by the writer of the screen play for the film and how well it linked with the students’ own lives. All reflected the content of the film. They were humane, anti-racist and political.

Here are a few of the images recalled:

I remember when Randa took her head scarf off in the car when she was with Hal. It represented her giving him love and abandoning part of her religion. (LL4) (LE2) (CM).

I can't forget when the bus pulled away carrying Randa back overseas and Hal could not even touch her through the glass window. It was a barrier to their love. They were physically separated. (LL4) (LE2) (CM).

Comments (social, creative and learning elements).

This reflection indicates that the lesson arose out of an examination obligation and I have labeled this as 'CP': creative purpose (Dudek & Coté 1994; Kohn 1993). In other words, an external requirement can provide an intention which can be creative. The purpose here was certainly external (the students wanted, needed or were constrained by peer or family expectation to pass this exam.). This creative aspect came from the teacher. The requirement to write about a film could have been taught with few creative elements by having students make notes and write an essay on the film, individually and without discussion. The internal motivation, argued in creativity research as being "deeper" and more productive, (Amabile 1983, 1990; DeCharms 1968; Deci 1975,1980; Golann 1962; Hennessey & Amabile 1988) was provided by the teacher choosing what she considered a more engaging way to learn about and experience films. It involved discussion, feeling, imagery and oral and written responses. In this segment students do not make something original or new, they do that later, but this is a step on the way to being able to create your own images in writing.

Whether this or any other methodology chosen can encourage students to think and learn creatively is the question posed by Nickerson (1999) as noted in Chapter 1 (p. 19). I think, in this instance, we can see that the link between the students' lives and the film as well as the art of the product affects the students emotionally with both sadness and joy as they experience and re-experience the film through their discussion and future creative work on it. The part played by emotion in creating and the power of emotion in recall is discussed in Chapter 2 (pp. 60-61) (Damasio 2006) and the influence of emotion in recall in Chapter 2 (pp. 60-62) (Blakemore & Frith 2005; Damasio 2006; Pascual-Leone 2001).

The images became more indelible as we heard them verbalised and discussed (LL1) and this added to their significance in the film and in real life. The connection between imagery, word, thought and learning threads through the first three chapters of the thesis

but particularly at Chapter 2 (pp. 53-55) (Blakemore & Frith; Torey 1999; Damasio 2006).

The social implications of the whole film in terms of racism, refugees and chauvinistic culture in Australia emerged in other lessons but the power of imagery within culture was certainly seen in this lesson through the students' choices of images and their interpretation of them.

5.4.3 Poetry (Year 11 English lessons, term 3, 2003.)

Description (as participant observer).

The Year 11 English class had to produce a "poetry anthology" including poetry of their own and others as part of their S.A.C.E. stage 1 course. There were loud cries of "I can't DO poetry" and "I don't LIKE poetry". It didn't take long for them to acknowledge that the songs they listen to in most of their spare time can be seen as their generation's poetry and there was a willingness to try to create (LE3) (CP).

I sent the students off in groups for ten minutes to find and bring back any object from outside to write poetry about (CCO). Triumphant, one group (of boys) came bouncing back with the claim, 'We'll never write poetry about THIS!! They had found a detached motorbike muffler. The other groups returned with sprigs of flowering wattle, holly and the like.

I chose the muffler to start with. I laid it on the carpet in the middle of our big circle and asked various students to come from their seats to touch it, closely inspect it and give us some words for what they were seeing and feeling (LI2). The words were written on the blackboard:

Courageous rider
Thunderous
Three carbon rings
A brand new bike
Shiny motorbike

Lightning fast
Smokey exhaust

Then I asked the students to imagine the muffler attached to the bike and in movement using the phrases and words which we had put on the board,

A courageous rider mounts
A brand new bike
The shiny motorbike, with its
Thunderous roar starts up
Smokey exhaust bellows from the
Three carbon rings
He zooms away; lightning fast

From these words and phrases each group made a collective free verse poem (LE3). One of them was as follows,

THE OLD MOTORBIKE MUFFLER

Thunderous
Lightning fast
The shiny motorbike
Cuts through the hills
The crash ends it all
The courageous rider
Flies through the air
Leaving only the old motorbike muffler
Three carbon rings
Smokey
Once a brand new bike
Once a human life.

As well as describing the moving motor bike vividly they had also given it symbolic meaning, ‘Once a brand new bike. Once a human life.’ (CM). They were considered “great” poems by the class. One of the boys from the group that had brought back the muffler said, ‘Who would have thought that we could write poetry about a muffler – and it was easy!’

Next day, we sat in the circle again. There was no muffler. Instead I asked the students to call up their own images in their minds, to “retrieve” it from “memory” (LI2). Then feel it, touch it, hear it, smell it in a process of transformation (CT).

The resulting vivid poems (CPR) were about: the bride in her crushed rose velvet dress whose marriage had been arranged and the colour of the dress therefore represented her wounds and sadness; a badminton match full of precision and speed and victory; an accident in a workshop where the hammer hit the hand and the blood appeared amidst the metal. The images had been generated through thought, speech, emotion and language (LL4).

Comments (social creative and learning elements).

A significant element of this lesson is the combination of the senses to create poetry. The first activity with the muffler is to touch it, look at it, feel and talk about it. This develops into seeing, hearing, smelling, feeling and touching an image in your mind. The extra layer, of an image symbolising something else, emerges from the phrase ‘one life lost’ in the class motor bike poem. This continues later with metaphor of the crushed, rose velvet dress indicating sadness and wounds.

The combination of senses in experience, thought and creativity are discussed in Chapter 2 (p. 51) (Pert 1999; Damasio 2006). The notion of holding two ideas in your head at once and being able to swing between two views at the same time has already been alluded to but Mednick (1962) takes this further, he sees associations and analogies as central to creativity Chapter 1 (p. 17). The transformation, or creative act, that of making something new and original, Chapter 1 (p. 6) (Mayer 1999), is the poetry. The purpose, on this occasion, is pride and enjoyment in the product.

While neural growth and connections cannot be seen in the classroom, learning certainly can be. The students had begun to learn to write poetry. They could do something new; something which they previously could not do. They were generating their own meanings as well as understanding those of others. It has been suggested that these moments of integrating what was previously known in a new and meaningful way

usually indicates neural growth and is ‘the essence of learning’ Chapter 2 (p. 64) (Greenfield 2004).

The students have not looked back in their desire to create poetry and write songs. There is a great wonder in the way we can call up an image and play with it, enhance it, change it, take it where we will through language and imagery.

5.4.4 Reflective writing (Year 11 English lessons, term 4, 2003).

Description (as participant observer).

S.A.C.E. stage 1 English required us to write a reflective and creative piece of writing about our childhood (CP). We started by bringing up our own images of childhood (LI2) (LE3) and describing them to the rest of the class through “memory”, “retrieval” and “speech” (LL1) as we had grown accustomed to do. Most of them were accidents.

Then I brought to the class three pieces of writing in which published authors described childhood incidents: John Mortimer’s opening to his novel “A Voyage Round My Father” (an image of old photographs), Sally Morgan’s description of early schooling from “My Place” and Dylan Thomas’s “Reminiscences of Childhood”.

After reading (LL7) John Mortimer’s prolonged image of photographs to describe his memories, we tried to imagine three photographs, each of which matched his descriptions – those on current display, those in dusty drawers and those that are blurred. We then gave them a name as the author did. This demands considerable mental agility as well as the power to recall and a vivid description ((LL4) (LL5) (LL6). All students asked could do it (LE4) (CPR).

From the imagined photographs and remaining texts we picked up other elements of writing reflections on childhood, those of perspective (seeing it through the child’s eyes) and description (vivid sensual detail) (LI1). Before going off to do the task we emulated some Dylan Thomas writing which produced one particularly effective stream of consciousness evoking the school library (CT).

Comments (social, creative and learning elements).

We had learned more about writing in a particular genre and we could do it. In learning terms, the generalisation here was childhood and we had added to its complexity through reflection and creation, the process described in Chapter 2 (p. 64) (Greenfield 2001).

An aspect not included elsewhere in these reflective practice entries of English lessons is the teacher's role in selecting literature. Whenever this occurs, it reinforces the availability of books and helps students in their selection. In this lesson they were not provided for analysis, but to assist in writing specifically. They were not introduced for replicability, - see Chapter 1 (p. 10) (Rowan 2007) - but rather for imitation in the sense of being able to inhabit the discourse of the "domain" as described in Chapter 1 (pp. 17-18) (Runco 2007; Nickerson 1999). There was also some modeling intended. Blakemore and Frith write about imitation and modeling (Blakemore & Frith 2005, pp. 159-163) and its importance throughout human development and learning. This particular modeling consisted of a number of examples of the ways in which other authors had reflected on childhood.

The later lengthy written reflections, on 'My childhood' extended into the social and cultural areas of varied early lives and relationships.

5.5 Mathematics.

I find it commonly assumed that creativity is concerned solely with the arts. Creativity across the curriculum is correspondingly an uncommon concept. Most secondary school teachers would not be surprised that the preceding examples of performance, drama and English lessons could be taught creatively; they might even expect them to be. They would probably accept that there are creative elements in the learning of history, geography, health, home economics and technical studies but science and mathematics would almost certainly not be in the list.

To test my theory that creativity in learning and teaching were not only possible but preferable in mathematics and science subjects, I joined the classes of Year 9 and 10 mathematics and Year 9 science as an observer and sometimes a participant observer.

I was looking for any of the characteristics of creative learning in the lessons I observed and also intended to introduce some, with the teachers' understanding and consent, and assess any differences which occurred. Given the emphasis I have given to language and thought in the creative process, I was particularly interested in the role of numbers in mathematics and science lessons: both their relationship with verbal language and as symbolic representations.

5.5.1 Equivalent Fractions (Year 9 Maths lesson, term 1, 2004).

Description (as participant observer).

The Year 9 mathematics class usually has a School Services Officer present because there are two students in this class with special needs. One is a student with Asperger's syndrome and the other a boy whose tuition had been sporadic when his parents were on the move during his primary schooling.

The students were arranged in groups of three and four in desks set up in fours. The teacher outlined what was to be learned "equivalent fractions" (CP). This was demonstrated using the board, questioning (LL1) (LL4) and the analogy of a pizza being divided into fractions (LEX1).

An exercise was set. Students completed it (CPR) being helped by the teacher or each other during the process. At the end of the lesson the teacher summarised briefly what had been learned and complemented the students on their focus (LE3).

I worked with the boy who has a literacy problem and is also often in trouble for minor misbehaviour. I discovered that he could read (LL7) the question easily, was quick to pick up the mathematical process being taught (LI1) but was greatly slowed when it was necessary to know multiplication tables. He would laboriously count on his fingers or

guess. I noticed that a boy nearby was using a calculator for these same relatively simple multiplications and additions.

At the end of the lesson, I asked Mr. C about this. To my amazement he said it was commonplace. Most students could not do mental arithmetic because they had not learned it in primary school. He said it was a big and fundamental problem in both science and mathematics.

I undertook to find out from the junior/primary section of our school why tables are no longer learned, why and what replaces them. I also offered to think of oral and written (language) ways for the Year 9s to learn them.

Both Mr. C and I talked to the class about tables. He explained that without them the students would be slowed down throughout the future and this would also hinder their use of the calculator later on (LL1) (LL4).

Later, I told them that I had found out from the Head of the Junior School that while R – 5 students still say their tables daily, this was not kept up for the necessary 7 years. They stopped doing this in the Middle School, years 6,7,8,9.

I told them, as a story, (LL3) my own maths history where I only learned arithmetic and while this kept me going through life it wasn't enough to take me any further. Not to know tables was worse than this. You could get cheated at shops, cinemas and so on. They really were basic to living (CP). We asked the students to come up with a solution (CO) (CPR). How could you learn these now? We also spent the whole lesson on mental gymnastics (LI1) using a table grid. The class did the work seriously and quietly. This may well have been because the teacher and I had posed a difficulty and sought a solution with the students; it was an authentic problem (CP) not just an exercise.

One group thought of a game (CO) (CPR) involving tables for next week. I asked my student M if he would say his tables to me. He refused but he was willing to use the grid. He learned by listening to me say the 12 times table. He completed all the 12x sums by the end of the lesson without fault.

We also agreed to do times table mental gymnastics on a regular basis as well as games next time (LI1).

The disparity in relation to multiplication tables practice was due to lack of consistent coordination from the junior section to the middle and senior schools.

In an Area school this would be the responsibility of the Maths Faculty or the curriculum committee. In this particular instance, although the multiplication tables matter was discussed with the Head of the Junior School, a key member of the management team, the issue never became part of any systemic change although she did seek to intervene personally.

Comments (social, creative and learning elements).

This mathematics lesson included characteristics of creativity and learning. Some were from the teacher but others from the students and they were engaged in by the whole class. The purposes and products were within the parameters of the lesson but certainly galvanised engagement. By this I mean that they were not yet transformative or original and did not transcend the lesson in any long term sense but were stepping stones nevertheless.

The suggestions I made introduced two creative elements: finding a solution to a problem and inventing our own ways to know times tables. It also built on what was happening in the class already.

The social issue of the complexity of the class in cognitive development terms was well managed with the use of a School Services Officer (S.S.O.), myself as a participant observer and a relatively small class size of twenty students.

The social cultural issues were manifested through, again, a strong cultural disinclination to lose face by saying multiplication tables out loud which was considered juvenile; the alacrity and good will shown towards making learning into a game or competition; the preference for the calculator as an aid to mathematical thinking rather

than memory or mental manipulation and the choice, by the teacher, of the locally well known and desirable pizza as the object with which to learn fractions.

Although most of the thinking was using images to make patterns via language (fractions of pizza) there was another interesting aspect in terms of learning too in relation to the multiplication issue. According to the findings of Blakemore and Frith, during multiplication there is a shift in brain activation toward the left hemisphere, whereas during comparison, activation is in both hemispheres with a slight preference for the right. They say this fits with the notion that multiplication, but not comparison, is dependent on regions in the left hemisphere that are associated with language. Multiplication in almost all education systems is learned by rote which is similar to learning the vocabulary of a language (Blakemore & Frith 2005 pp. 57–62). What is interesting is that in this case the boy could easily handle the other verbal requirements of the mathematical task but not the so-called ‘rote’ part. He could not retrieve times tables from memory or summon up the images of the numbers. It may have been that during his discontinuous early education he had simply never learned his times tables by saying them out loud. The student with Asperger’s syndrome had no problem with numbers which is as the literature describes.

5.5.2 Algebraic Equations (Year 9 Maths lesson, term 1, 2004).

Description (as participant observer).

Another series of lessons was concerned with algebra. This was of particular relevance to my thesis, given the different symbolic nature of words, number and letters representing numbers.

An algebraic equation was written on the board for all to copy (LL6) and understand through discussion (LL4) (LI1) (CM). This was followed by the student’s own equivalent equation solved next to it. The students had to engage with the process themselves rather than copy or find a right answer.

They created the equation and explained how they did it (CO). The talking was to each other as well as to the teacher (LL1). Gradually, the steps increased using this model.

Not only were the reluctant willing to be included (LE3) but, the teacher told me, on one occasion when this methodology was used in Year 10 Maths, two students commented to a visiting Year Coordinator, ‘We are learning something useful!’ (CP).

Comments (social, creative and learning elements).

The first sentence of the reflection refers to the different symbolic nature of words, number and letters representing numbers. The interlinking of symbolic representations is discussed in Chapter 3 (p. 80) (Damasio 2006; Greenfield 2001; Hensher 2009).

Since number is a condensed and concise representation and can be manipulated infinitely, like words, it is important to see in this lesson that the symbols were understood and used by the students to make meaning through verbal language. This was of two kinds, to each other and to the teacher. The opportunity for both is significant according to language studies showing that the peer or small group conversation forms a bridge to the more formal address to the teacher and class. This conversation or ‘expressive speech’ is the agency by which the students acquire the ability to perform new mental operations. Expressive speech is one of the more accessible forms (of meeting new demands); the language of scientific hypotheses, spare though it may be, comes later’ (Barnes et al. 1971 p.115).

The students also had the opportunity to operate the algebraic equation themselves. The educative power that the act of creation provides not only in what it constructs but also in enabling the maker to understand and be reflective and critical of other such creations is referred to in Chapter 2 (p. 41) (Savery 2006).

Plainly it takes more than the methodology described above to retain engagement and involvement throughout a whole course. While there are many important processes and qualities to the learning interactions already described, perhaps the strongest aspect is that of the product and the corresponding purpose. As in this algebraic example, it provides a sense of pride and success when completed and is usually done cooperatively.

There were some interesting indications in relation to symbols and meaning making in these mathematics lessons. One was that students always knew the same number multiplication 4×4 , 7×7 , and so on suggesting the importance of the language areas in the brain where rhythm, rhyme and pattern assist memory so frequently and can be used to good effect in teaching (Blakemore & Frith 2005, p.48). The students enjoyed talking about what their brains do (metacognition) and what processes they follow to do the arithmetic, such as fingers for $9 \times$ table and turning numbers around, leading up to problem multiplication.

The lesson incorporated several elements of creative learning. The notion of learning from what we already know, building knowledge from the simple to the complex, gaining confidence and understanding in the process through discussion and problem posing and engagement were present throughout. The different language registers also helped the learning and understanding as they built bridges between the known words and concepts and the new ones introduced by the teacher (Barnes et al. 1971 p.115).

Learning mathematics appears, at this stage of development, to be similar to the brain functions used in general learning, perhaps with the exception of greater use of the right hemisphere for non-verbal visual and spatial approximation.

Learning aspects included memory and retrieval, mental manipulation, the continuous interaction of external and internal imagery, manipulating symbol, transformation, product, and above all making connections through language. Given the frequent lack of engagement, relatively high level of abstraction and mental agility required in mathematics, creative processes did appear to assist learning and commitment in the ways described.

5.6 Science (Year 9 science lessons, term 1, 2004).

Description (as participant observer).

5.6.1 General Science

The contrasts in language and learning in the Year 9 science and Year 9 drama classes for the same students were striking. In the Year 9 science class students were studying the prescribed subject for the Year 9 course for that particular term. They were reading text books (LL7), hearing scientific teacher talk and writing (LL6) in the form of copying notes. I saw no transformation, connection, reflection, cooperation or discussion. There was no student talking except in resistance to tasks, sometimes rudely. There was no understanding through application, no excitement in the learning and no ostensible purpose or product.

Many of the students in the class were also in an “own choice” short course subject with me called “Organising an Assembly”. Our first lessons had included a tour of the School Hall, talk about its history and potential, a look at the lighting rack, grid and sound system, the curtain opening mechanism and the establishment of flats on the stage. This had been followed by speaking in twos to an audience in a spot light. Here too these same students from this same class had been animated, interested and enthusiastic.

I believed we need these student characteristics in the learning of science. If my supposition was correct and optimal learning is activated through creative teaching then the question became: What were the differences? Was it that I spoke to them like adults; involved them in a common purpose; told them stories? Was it the level of complexity of what was being learned? How important was language and abstraction in science? Was it cultural? Was it the teacher? How and what had to be changed in science?

The answers to these many questions became clearer as I worked with this class and their teacher in the science and “own choice” classes for the next 10 weeks.

5.6.2 Vitamins (Year 9 science lessons, term 1, 2004).

Description (as participant observer).

Mr. P was teaching the Year 9 class from the course text book but embellished by his personal teaching experience and knowledge. In the last week the students had learned about vitamins and enzymes. He often used analogies and stories (LL3) to help students understand theoretical constructs.

He tried to make connections but they were his not the students' at this stage. My aim therefore, with the agreement of the teacher, was to get them to say what they had learned in a creative way. I asked them, in groups of four, to make up a short, oral advertisement to persuade people to increase their vitamin intake (LL1) (LL4). This injected a number of creative aspects into the learning process: a product, the opportunity to create together cooperatively for a purpose, to talk about and actively shape what they were learning and make their own connections (LC1).

The first thing I noticed was that the students were not able to say what the importance of vitamins was. For example, 'He can be skinny and he can be fat and that'd be because they haven't eaten their vitamins.' I asked which vitamins make you fat or thin. There was a flurry of page searching while the students in this group REALLY tried to find out the effect of vitamins on the body (CP) (LE3).

Finally, each group (CCO) acted out their advertisement (CPR) (CT) (CO). After each group finished, I commented on the talking and Mr. P on the "science". The presentations all followed the current culture of advertisements – repetitive, people representing those without the advantage of the product, scintillating hosts and so on.

Mr. P told the students that the main scientific holes in understanding were: the benefit of natural rather than artificial vitamins, the effect of synthetic vitamins, and the waste of having too many and the side effect of closing the body's natural generation down. He also mentioned the need for "roughage" which is derived from fruit and vegetables

but not from vitamin tablets. He reiterated that you need vitamins when you become sick but you would not need them if your daily intake of vitamins was satisfied.

Mr. P told me he was able to see where the holes were in their knowledge through this process and was able to fill the gaps at the end of the lesson. He said he was pleasantly surprised at the success of the process. He thought he would get “junk”. By this I believe he meant a worthless response from the students arising from a casual attitude to the work which he associated with what he considered a non-scientific process. He noted their seriousness (LE3).

To wrap up the lesson I introduced, supported by Mr. P, the effects on the body of bulimia/anorexia. I did this to further mark the reality and seriousness of what we were learning (CP). I also used real life examples or stories (LL3).

Comments (social, creative and learning elements).

I noticed that despite all the teacher talk in the previous week, and all the book referencing, most of the students had not known the actual effects of vitamin deficiency on the body. The idea of ‘linguistic-conventional’ or ‘linguistic-intellectual’ subject-specific linguistic registers is examined by Rosen who proposes that ‘the language of secondary education’ is not specific to curricular subjects and forms a potential barrier to learning discussed in Barnes et al. (1971, p. 12).

When they had been given a reason, a purpose to find out and had to articulate it in their own way, Chapter 2 (p. 40) (Dudek and Coté (1994); Kohn (1993), then they had worked through the ‘linguistic-intellectual’ science in the text book beginning to understand it through small group discussion and with teacher help. They had also experienced the ‘elation’ described by these two authors at their creative product.

I was also aware that Mr. P was open to reflection on his own teaching, on aspects of learning and change. ‘He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation (Schön 1983 p. 68). He was enthusiastic about becoming creative in

science. The following incident reveals some interesting learning and social issues which can arise out of such a school experiment:

It began at the next meeting after the lesson where the students had presented their vitamin advertisements. His first words were, “You’ve got me thinking. I...” Inspired by the last lesson, he had worked out the following proposal:

Given that we were an Agricultural School, which also had a Technical Studies facility, we could make a video of his analogy to help students understand vitamins and enzymes. (His analogy was one of spanners and engines.) The Year 9 students would devise and perform it. It could be done on the Year 9 “Own Choice” line where there is a film making group.

He said the outcomes would be:

- Students would really understand the concepts by DOING.
- It would serve as a teaching tool for other students.
- Other students would be involved in the making of it – spreading the idea.
- It would promote the school via our internet site and projected display on a large screen at parent nights.

Mr. P had become enthusiastically creative. This proposition had many characteristics of creative learning and could potentially affect a large number of students. I envisaged more learning and creativity for us all as we worked through what imagery would really connect with an audience, writing a suitable script and so on. We agreed to proceed to see if we could organise it.

Ultimately, we were defeated in this enterprise when “own choice” courses were discontinued. This administrative decision affected all of the middle school, staff and time tabling. It could not be changed for the sake of our project which would have involved only a relatively small number of the students involved.

In retrospect, I believe it could have been achieved but only as a curriculum initiative planned well in advance, or where a school had adopted an inter-disciplinary approach across the curriculum.

5.6.3 The processes and the formulation for energy transformation. (Year 9 science lessons, term 1, 2004).

Description (as participant observer).

In the second part of the course, Mr. P described what he really wanted the students to learn from the whole segment being covered in the five week block. It was the processes and the formula for energy transformation. He had taught this, the students had read this, he had discussed this with students, and he had made models of this – all to no avail. And yet, this was the fundamental biological life process. My job was to work out a way for students to want to SAY this so that they KNEW it.

The plan I devised, with Mr. P's acceptance, was:

Form groups of 4 – you are teachers. (CCO)

Work out your way of presenting this concept THE PROCESSES AND THE FORMULA FOR ENERGY TRANSFORMATION to students so that they can learn and understand it. (CT) (LL6) (LL1) (LL4) (CP) (CPR)

You may use pictures, the white board, oral explanation, real life examples or any thing else you can think of. (CIM)

Present it to the class and teachers. (LE4)

Group 1 chose to tell us about the old growth Tasmanian forests and the results of logging on trees, animals and oxygen production. (LL5)

Group 2 put diagrams on the board and with humour (LE1) explained the scientific diagrams

Group 3 showed a family scene taking place in the future. Grandma had a leaf (made out of paper and crayoned green) which was very precious. She explained to her

grandchildren what a leaf used to do in the old days before we lost most of the trees and had to wear oxygen cylinders to stay alive. (LL3) (LI2)

Group 4 discussed in role the jobs of Enzyme, Vitamin, CO₂ and H₂O. Each tried to out do the other in importance but really each was necessary as part of the team. (LE1) (LL1)

Mr. P, as their teacher, praised them and observed with pleasure that all the groups together told the whole story of energy. He also made some minor corrections.

The process of using creative learning had worked for students and teacher alike.

Mr. P then told me that on the following Monday week 5 the students would have finished that unit of work and would have to have a test. Although I really wanted to suggest an alternative to the test I didn't feel I could interfere with the culture, tradition and practice of this faculty.

I wanted to intervene because:

- Tests depend on your ability on one day.
- Test items may not be the ones you revised for.
- Tests lead to rote learning not understanding in many cases.
- Tests do not promote talking your way into understanding with group or teacher.
- Tests are part of what makes students "hate" science.

I was delighted therefore when Mr. P hailed me across the school yard and said, 'I'd like them to say the test not write it!' He wanted the test to show that the students had learned the fundamentals of photosynthesis. He then carefully collected the usual questions on this piece of work and arranged them in a way which would make them orally answerable.

Meanwhile, the students had seen me and said they were afraid to speak alone. They agreed that they could do it in groups as they did in drama. Mr. P had had the same response and by the time I saw him had further organised the questions so that they fitted together in groups of 4. The talking had to be 1½ minutes each.

Comments (social, creative and learning elements).

In social terms the students had, unusually in this science course, worked cooperatively in small groups. The explanatory presentations they had created had been successful in their eyes and those of the teacher. The outcome of their collaboration was as a result of what Freire termed ‘critical and creative participation’ Chapter 3 (p. 99) (Freire 1987). They had also requested that they work in groups again for the oral “test”. This would enable them again to make the bridge between their own informal language, in respect of the textual material they had as their source, to that of more defined and formal meaning making for their oral presentations (Barnes et al. 1971 p.115). From a larger social perspective, they had also connected what was learned in the science class room to the outside world: their own bodies and the effects of enzymes, vitamins, H₂O and CO₂; the effects of logging old growth forests and the effects of environmental degradation on a large scale for future generations. To arrive at such generalisations through discussion and processing knowledge is an example of the beginning processes of higher order thinking, Chapter 2 (p. 64) (Bloom 1956).

From a creative perspective the students had moved from elements of creativity in their earlier advertisements to transformation in these presentations. They had made something original and new for a purpose, albeit on a small scale. They had formulated a practical way of ‘effectively communicating those ideas and of persuading people of their value’ Chapter 1 (p. 15) (Sternberg & O’Hara 1999).

As far as learning was concerned, they had learned and understood enough to be able to transform what they knew. The importance of choice and authentic task as a spur to learning has often been observed (Dudek & Coté 1994; Kohn 1993) and is described in Chapter 2 (p. 40). The teacher’s reflection and action also continued as he volunteered to change the method of testing from writing to talking in small groups.

5.6.4 Preparation and alternative test on photosynthesis. (Year 9 science lessons, term 1, 2004).

Description (as participant observer).

On Friday's lesson Mr. P put aside 10 minutes to give out the questions and make sure all the students were aware of what was required.

Afterwards, he told me,

1. It took the whole lesson because the students really wanted to know what the questions meant (LL1) (LL6) (LL7) (LE3) because there was a purpose and a need to know. (They had to say it in front of their peers. It was risky – you didn't want to make a fool of yourself and look stupid – unlike the written test where nobody sees but the teacher and there's a culture of it being macho and cool to get a low mark.) (CP).
2. He realised that as each group answered the questions the students would hear these concepts yet again but this time hear them in a way that their peers had decided made them make sense (CM).
3. He realised that the students really did need help to understand the questions. (LL4). He realised that how the question was worded mattered. Knowing this equalised the opportunity for student success because the usual "A" grade students were previously the only ones who could understand what the questions were asking. The students worked together to understand what was required and collaboratively decided who did what in the group (CCO).
4. He discovered that it was not so much the science that was difficult for students to understand as the language, the language of science. Brain development in relation to concept formation, the role of language in this and the importance of prior understanding as a bridge into new understanding and learning, all became topics for discussion (CO).
5. He said it was a real learning curve for him.

The effect of a creative learning perspective on this teacher's reflection of what had happened in the lesson was clear and to me exciting.

We were now ready to see how all this translated at the "test" lesson in the following week.

Their presentations took two lessons because students were away so that some groups were incomplete. There were also various excuses/reasons for not being ready. Eventually, everybody presented (CPR).

Only two students out of 20 really used their own words to answer the questions and get the ideas and information across to the audience. The others either read gobblets from books or notes or copied diagrams from the book on to the board and pointed to the appropriate parts as indicated in the text book. They still didn't know the material well enough to say it. Many showed that they still didn't understand the language of science in the question. The teacher's questions were not theirs.

I asked myself whether this were necessary. Was it scientific rigour or school science register? Did hearing the answers expressed by the students and the teacher help the other students in their understanding? Did being told what they had missed or misrepresented help the learning?

Mr. P suggested that he give the students the usual written "test" to see if their achievement was any better than similar classes at this level whom he was currently teaching or had taught. I agreed.

We had a few minutes left at the end of the lesson so Mr. P continued with the names of the elements which are part of the next course on elements, atoms and molecules. Many students could recall the mnemonic and fill in the grid but not remember the full names for the elements.

I suddenly remembered the song by Tom Lehrer where the elements are put to a tune. Since we remember a lot of numbers and letters by their rhythm, I promised to find it and bring it. One student said that we could make up our own song or other way of

remembering the names of the elements. Creativity called for from a student; I decided to follow up on this.

Meanwhile we awaited the test results; an important touchstone for Mr. P.

They were no better or worse than he would have expected. Mr. P could only then ask: why waste time on trying for greater understanding and not get through the curriculum?

This chicken and egg question is perennial in so called “knowledge rich” subjects.

The big questions still hung there. Was it more important for students to cover less more thoroughly or keep up with the “curriculum” with only a passing understanding of the material? Was the language of science real or historico-cultural? Were the student brains ready for this abstract thinking at this age?

I decided to devise a different ‘test’ for the students for their next topic. What would happen if they talked about what they knew about bonding atoms? Would it help if they wrote down what they knew first? The transcript of this science ‘test’ I devised on understanding the bonding of atoms provides further illustrations and insights in the next section.

Comments (social, creative and learning elements).

The preparation for the oral presentations had the characteristics of social learning, namely, joint purpose, cooperation and risk taking. These qualities have been observed often in the lessons data and occur frequently in the literature, respectively, Chapter 1 (p. 18) (Nickerson 1999); Chapter 2 (p. 74) (Andreasen 2006); Chapter 1 (p. 14) (Getzels & Jackson 1962). One additional characteristic was present, the serendipity effect of group presentations providing the opportunity for other groups to hear explanations in different ways which can help understanding, either through repetition or new connections made from different viewpoints, ‘seeing analogies and relationships between ideas or objects that have not previously been related’ Chapter 1 (p. 25) (NACCCE 1999).

The preparation lesson raised again the language of science as ‘linguistic-intellectual’ or ‘linguistic-conventional’ and the problem for the students of understanding either. Many teachers and researchers have considered the nature and kinds of ‘discourse’ in addition to Britton, Barnes and Rosen previously quoted. Gee (2001, p. 526) describes two fundamental discourses, the primary one, that of our local families and local community, and multiple secondary discourses learned through life. Luke and Freebody propose four practices that allow learners, as they engage in reading and writing, to break the code of texts, participate in the meaning of text, use texts functionally and critically analyse and transform texts. These four practices encompass reading, social and critical understanding and transformation. Such a ‘family of practices’, they suggest should be a part of literacy and numeracy across the curriculum, over time and beyond the school community (Luke & Freebody 1999, pp. 2-3).

However, the fact that scientific discourse was a difficulty became plain to the teacher who was still willing to learn about this, to act and to change.

Unfortunately, the results of the oral and written tests were an obstacle in terms of progressing in a non-traditional way in this science class, especially the effect on the teacher for whom it was a real set back. However, it did raise well known and important questions: set, compulsory topics in curriculum, the role language plays in learning, especially discourses and registers, and the growth of abstract thinking in adolescence. It also allowed me to conduct a further trial and research and finally frame a better pedagogy than practised here.

In this chapter, the author’s reflective notes on a variety of lessons across the curriculum with students of varying ages have been interpreted, analysed and coded in terms of creativity and learning. They have revealed degrees of success, difficulties and achievements. Many connections with aspects of the literature considered in Chapters 1, 2 and 3 have been made and discussed

The next chapter takes us still closer to the learning hub through sections of transcripts where it is possible to see at closer hand characteristics of learning creatively and in particular the role of language.

PART 2

CHAPTER 6

TRANSCRIPTS

Transcription

In an attempt to ‘understand pedagogy by observing and participating in actual teaching and learning in schools’ (Introduction p. 1), I have in the previous chapter analysed and interpreted descriptions of lessons. In this chapter three transcripts of lessons are used as data. To be consistent with the qualitative methodology described in Chapter 4, the analysis is concerned with social, creative and learning elements, as it was in the lesson descriptions in the last chapter. The time, place and researcher role are noted for each transcript. The learning and creativity codes developed in Chapter 5 are inserted, as they were in the previous lesson descriptions. The data demonstrate the difficulty, the effectiveness, the relevance and the process of creative learning and the role that language plays. The total transcripts as they were copied and annotated for teacher reflection are provided with the codes in Appendices (4), (5) and (7).

The recorded lessons are transcribed and interpreted. The interpretation of the teacher at the time was that of the creative reflective practitioner. The choice of extracts in this chapter relate to the criteria set out above: the social, creative and learning elements and the presence or absence of the learning codes.

The reason that the first transcription is less than the whole of the lesson is that parts of drama lessons are collective talk and acting by a number of small groups of students simultaneously which are impossible to transcribe. The second and third transcripts are almost entirely transcription given that they largely comprise talks and discussion and can therefore be audio taped and heard clearly.

The transcripts provide an additional dimension too, not only what the students and teachers said in the lesson and the interpretation of this by the teacher in reflection afterwards, but also the additional perspective of the research literature. This is applied

in this thesis, some five years after the lessons took place, the transcripts made and the reflection written.

6.1 Qualities of transcripts

Transcription of talk allows us insight into what is being thought. In group discussion it helps us to see the effect of group contribution on language and thought. As such it is the closest we can come to observing learning in progress. Steven Pinker referred to language as a window on to thought and language as ‘the most accessible part of the mind’ (Pinker 1995 p. 419) and Paulo Freire (1978) exhorted us to be sure to record the conversations. Freire believed that a record of discussion constituted an important document because it allowed for the study of the progress of the work and could also be used in evaluation. As such it became a means of training linked to the search for new forms of action. Looking at one’s own practice as a problem provided the critical moment in evaluation, enriching subsequent practice and being enriched by it.

Transcriptions are very rarely used in teacher professional development, student teacher education or in the many manuals on improving teaching practice. They may be considered tedious to study but the transcriptions of whole lessons are illuminating in their detail and demonstrate the development of language, thought and learning more than isolated examples do. In the detail of the transcripts we can also see the part language plays in transformation and creativity. Where excerpts have to be used because of lack of time or space, as they do here, they need to relate to the whole and, where possible, provide the essence or crystallisation of an aspect of the creativity and learning characteristics occurring. This will be attempted in this chapter.

Transcripts can also be educative in terms of improving practice, as suggested by Freire and noted above, and in a sense are also hard copies of the scripts that teachers mentally evaluate continually as lessons progress. For example, one undergraduate course in education at Flinders University (EDUC. 2402, 2403 Development, Learning and Inclusive Teaching) uses a series of video recordings of actual lessons and the students watching them are able both to critique a wide variety of learning issues and to practice looking at a pedagogy in motion which will be their own experience in class rooms in the future. It is both useful and valued as a tool for learning by the students.

6.1.1 Year 10 drama discussion on poverty and plays (July 2004, double lesson, one hour forty minutes, in the drama room).

Description (as participant observer).

The transcript, description and annotation of this lesson see Appendix (4) were written as a reflection on a drama lesson. The theme was “poverty”, a social issue previously chosen by the class. Briefly, the students move to an understanding of the issue, from word denotation to connotation, from meaning to implication, and thence to generalisation, Chapter 2 (p. 65) (Torey 1999). They say what the word means, show and say what the issue feels and looks like, and, with those gathered characteristics, grow a concept of poverty. They then reproduce the concept in narrative form as an improvised play. Lastly they look at, discuss and act part of a scripted play on the same theme.

Comments (social, creative and learning elements).

6.1.2 Inquiry through questioning and discussion.

The first learning process observed is that of inquiry; posing a question central to the theme. The teacher says, ‘Why are people poor?’ We know from the literature that inquiry and problem posing are important in both learning and creativity. In Chapter 2 (p. 41) (Savery 2006) refers to Dewey’s central tenet of inquiry in learning. Chand and Runco (1992) - as noted in Chapter 1 (p. 15) - correlate problem solving with creative insights. The success of self-generated questions from students and students’ choice of an issue or problem have also been noted, in particular Chapter 2 (p.40) Kohn (1993) who observes that there is greater interest shown when there is the chance for the participants to choose. Runco (2007) – see Chapter 2 (p. 35) - also notes that individuals put more effort into solving a problem when they are somehow motivated to do so.

The transcript reads, 'A thinking time of ten seconds is allowed'. The teacher acknowledges the importance of thinking and helps to provide an environment for focused thought on the question.

Students offer explanations (LL5). The teacher confirms or explores each briefly. She limits it to 6 speakers.

The students say:

- Family doesn't love you, so you leave and are poor.
- Alcohol and gambling.
- Bad things happen and you spiral downwards.
- Homeless young people.
- Sexual harassment, break up of parents and you run away.
- So poor you look forward to being jailed.

This is an example of prior knowledge and concrete experience being called upon to answer an abstract question, a process identified by constructivist learning theory, as we saw in Chapter 2 (p. 36) (Jensen 2005). It also sets in motion the pattern of real life experiences coming together under a generalised concept referred to in Chapter 3 (p. 91) (Vygotsky1962).

6.1.3 Engagement and empathy.

The literature indicates the importance of emotion in creative learning, as noted in Chapter 2 (p. 36) (Jensen 2005), (Caine 1994) and also Chapter 2 (pp. 60-61) (Damasio 2006). The stimulation of the senses is particularly set up in the drama room and arousal and empathy occur through being stimulated and engaged,

The lessons are always varied in activity, exciting and arousing in a stimulating environment (lights, pictures on the wall, vocal and musical sound, costumes and props).

The engagement, that is commitment to the task without distraction, eventually comes through the creativity of dramatic improvisation in the lesson but at the beginning, we read, 'There is no time allowed for disengagement of students on arrival. The process

begins straightaway and is physical.’ For Year 9 students physicality is particularly engaging. This fits generally with developmental studies which indicate a predominance of physical activity at this stage for boys and less strenuous activity for girls, decreasing in years 7, 8 and 9 (Anderson et al. 1986; Godin & Shephard 1986).

One of the ways of understanding poverty is through feeling it,

- All become physically small
- All are drawn into themselves
- One uses a newspaper

The teacher asks why everybody went small and withdrawn. The answers, in summary, are that they were: ashamed, powerless, isolated from everyone else, sleeping on benches or hiding.

This exercise and those that follow, including the discussions, are based largely on empathy. In the literature we have read of the mind and body being ‘indissociably integrated’, in Chapter 2 (p. 51) (Damasio 2006) and the confluence of the senses in our experiences and consciousness (p. 51) (Pert 1999). Here empathy is an explicit part of learning and relates to the purpose of acting characters who are poor.

6.1.4 Language.

The role of language in thought, speech and discussion, not to mention the acting that is to come, is, again, explicitly called for by the teacher.

The teacher says:

“SITTING ON YOUR CHAIRS, SPEAK ME POVERTY.”

A thinking time of ten seconds is allowed (LL4).

The students say:

- I’ve been begging and stealing
- I’ve been trying to find ways of keeping warm.

- I've been trying to keep warm in a doorway.
 - I've been selecting rubbish bins.
 - I've been scrounging for food.
 - I've been walking, walking, walking, walking shoes are important.
- And so on.

Each sentence was repeated in different words by the teacher and confirmed by the student with all the others listening (CIM).

(This is partly so that everyone can hear and understand but also acts as a repetition. Occasionally the statement is rephrased to make the meaning clearer by agreement with the student.)

This meaning making process using imagery and word is referred to by many researchers but specifically in Chapter 2 (p. 36) (Jensen 2005).

The variety of language and thinking from concrete to abstract; making connections is always present

Concrete, gut feelings:

'I haven't been throwing anything away because it's very precious.'

'So poor you look forward to being jailed.'

Making connections in this way is again highlighted in the literature on both creativity and learning and in Chapter 2 (p. 35) 'nuances' or gut feelings are described by Runco (2007) as 'elements of creative cognition, not just creativity'. The last two sentences in the excerpt above really are emotive, both as compelling images and the beginnings of a story described as 'dramatising things that people already knew, shaping them' by Carey (1981) in Chapter 1 (pp. 27-28).

The story is in the created plays and the recollections in group discussion, either to provide concrete examples towards a generalisation, or towards the creation of a play's narrative.

The transcript gives us the details of a complex improvisation which had a strong and “tragic” narrative. In addition it is noted:

(The implication is that he has raped the daughter: the ultimate exploitation of rich over poor. The imagery and symbol created in the play (CM) reflect elements of the earlier discussion on why people are poor.)

Scripted plays also engage because of the story.

6.1.5 Meaning.

Human interaction is a constant exchange of meanings but in this lesson, and drama lessons in particular, there is an added emphasis on how this is done. Although this is ostensibly studied in order to improve acting, it spills over to the perception, production and registers of oral language or ‘talks of different kinds’ in real life (Britton 1972, pp. 237-244).

The teacher says, ‘Was any phrase different in meaning because of the way it was said or acted?’ (She is referring to ‘Angel’s Children’, the scripted play, where two groups had chosen the same excerpt to act.)

Two phrases were selected. Each had been said differently in the two performances.

1. ‘Why do you let him boss you around?’
2. ‘It’s out or it’s out.’

(The discussion was about the way in which things are said: tone, emphasis on some words rather than others and how that affects their meaning. Examples were raised about how we talk to teachers and their reactions. The discussion also connects the scripted play, poverty and real life) (LC1).

6.1.6 Reflection.

Much has been written about the importance of reflection in learning for both students and teachers (Schön 1983). Reflection after activity offers the opportunity to see the big picture and analyse the activity in hindsight to learn from it. It enables us to build on

the experience and improve. It is often difficult as a busy classroom teacher to find the time for self reflection during or at the end of the day or for student reflection at the end of the lesson or project. Journals and diaries can help in individual reflection but group reflection at the culmination of the activity is very productive. Revisiting the learning later is beneficial too; it allows time for incubation.

In the transcript the teacher chooses one simple and direct question to start the reflective group process.

The teacher says, ‘Say something honest about the ACTING!’

The discussion included:

- The effect of the audience and nerves;
- Script versus improvisation and
- The idea from a student that, ‘the actor writes the script.’ This apparent paradox was explained by the student saying that the actor gives actions and dialogue to words through interpretation (LL5) (CM).
- Some actors specially praised and clapped by the group
- ‘You become more intimate and less shy.’
- ‘Because you’ve got to work together you work on each other’s strengths and you’ve got more opportunity to do that in smaller groups.’

6.1.7 Making pedagogy explicit.

Metacognition or thinking about how you are thinking is a powerful learning device listed as an ‘Essential Learning’ in the senior years (SACSA 2009). Thinking about how you learn is similarly constructive. At this part of the transcript we see the principal of the school presenting to the students their own learning; making the pedagogy explicit to them. He is connecting the way they learn to what they learn:

Learning always has to do with the relationship between you, the teacher and the other students in the room. The partnership that the teacher sets up - the learning environment - is probably some of the best I’ve seen. All drama and productions in this school have always been meticulous. Everything that’s happened has been about learning, sharing, giving everyone an opportunity.

Cooperation – you have to take the opportunity. Moving out of poverty is getting the opportunity to learn, in a country where that’s possible. Your teacher always praises everyone at the end and is inclusive. You are not just learning about drama but real life issues that you chose – the new curriculum – you learn it better by doing it – most of you are here because you do things.

The school principal makes the pedagogy explicit to the students at the end. The teacher frequently does that too, sometimes at the beginning, during and at the end of lessons.

The principal and the teacher share the view that school should not be a collection of formalities and conventions particular to the institution “school” but should be driven by learning and the processes of learning which are most successful

Students in secondary and tertiary education appreciate knowing, sharing and contributing to the pedagogy. For secondary students it seems to confirm their entry into adult learning and for tertiary students, learning to be teachers, it explicitly links pedagogy to theory. Such explicit pedagogy emanates quite naturally in the learning situation established by creative teaching.

6.1.8 Purpose and product.

These two qualities are at the heart of creativity as we have seen in the research in Chapter 1 (p. 18-19) (Nickerson 1999) and in Chapter 3 (p. 92) where Freire (1972) suggests that discussion for a specific purpose leads to a consideration of culture and reality in a critical way. They are found in the creativity of drama lessons but serve an added function. Purpose, sometimes short term, sometimes weeks or months in length, engages the students, and the product is the purpose made manifest. In addition, there is the galvanising power of the risk taking in this final product which has already been illustrated Chapter 2 (pp. 71-72) (Harris 2006) and referred to in Chapter 1 (p. 158 (Freeman 1983).

Purpose and product, with these roles, are touched on in the transcript.

In a later lesson this discussion (on the play 'Angel's Children') was continued watching a video of its public performance (by previous students at the school) which was not only useful to this particular learning but also paved the way to the privilege and achievement of future public performances.

These (improvisations) are rehearsed and then shown to the whole class. There is excitement, responsibility and the courage of performance (LE7). The teacher requests that one of the improvisations be shown at the assembly on the following Monday for the visiting Japanese students (CPR).

(This takes the product to a wider and more challenging audience giving a sense of importance to the actor students as well as providing a purpose (CP) for them to achieve more.)

The lesson recorded (partly described and partly transcribed here) is in no way extraordinary. The principal, other teachers, school services officers, other classes frequently come in to share in the product which has been created.

6.1.9 Cooperation and confidence.

Although individual and group work is always part of any lesson, learning more often happens with others in a social working context without conflict. It is there also that confidence grows. These two characteristics are demonstrated in the transcript,

The teacher sets up improvisations to be done in self chosen groups of approximately 4 students (CCO).

(This requires cooperation. Self chosen groups may be alternated with teacher chosen ones depending on the level of learning and collaboration.)

1. Poor people on a park bench.
2. Poor people in a family.
3. Poverty somewhere in the world.

(The difficulty of these three situations increases in complexity to grow confidence)
(LE4).

6.2 Year 9 science: talking to understand atoms (March 2004, double lesson, one hour forty minutes, in the science laboratory and adjoining room).

Descripton (as participant observer).

This transcript arose from the situation described in Chapter 5 (pp.189-190) where an attempt to learn a set of concepts in science in a more creative way had apparently not succeeded. Hypothesising that this may have been because the ‘language of science’ was problematic, an opportunity was provided for the students to answer the teacher’s question through a different process. The process focused on individual understanding through thinking, writing and talking, given the importance of language and thought for creativity in learning in the research, Chapter 3 (pp. 82-83) (Torey) on the process of thought into word; (p.84) (Wallas) ‘How can I know what I think until I see what I say?’; Vygotsky (1962, p. 82) ‘The change from maximally compact inner speech to maximally detailed written speech requires what might be called deliberate semantics – deliberate structuring of the web of meaning’.

The research questions were, ‘Can students articulate orally their understanding of the concept of atoms bonding? What role does oral and written language play in their learning?’

The original question from the teacher was, ‘What happens to make two nasty substances become one nice?’ In answer to this question, the students were each asked to read from their own notes out loud. They were then asked to answer again without their notes.

The following research questions were then posed in relation to the student responses:

1. Is the concept understood when spoken from their written notes?
2. Is the concept understood when speaking afterwards without notes?
3. How does the language change? Does it matter?

The role of language in this learning is complex and interrelated. To answer the question the students have had to understand the teacher's verbal explanations (listening and understanding) and those of the text book (reading and understanding); transform this understanding into their own text (writing and understanding) and then be able to know it sufficiently well to be able to express the ideas fluently and unaided in speech. The common denominators in this process are language and thought but the specific steps of listening, reading, writing and speaking are multifaceted, discussed in Chapter 3 "Language" (pp. 80-92).

Much has been written about the difficulties many students face when they have to solve word problems as opposed to numerical questions in mathematics, to 'decipher particular features of the mathematical discourse in order to be able to decipher the meaning and mathematics of the texts' (Zevenbergen 2001, p. 22). The author is of the view that literacy demands in the mathematics classroom are not explicitly taught. She points also to the lexical ambiguity of some mathematical terms, square 'roots' and 'common' fractions and concludes that 'many of the skills needed to be numerate demand high levels of literacy' (Zevenbergen 2001, p. 22). It has also been argued in Chapter 2 (p. 54) (Blakemore & Frith 2005) that language is a necessary component of mathematics. This research assists us in analysing the difficulties the students, recorded in this transcript, experience as they try to decipher and make meaning of scientific terms.

In an effort to conceptualise mathematical literacy, Brown & Hirst (2005, p. 30) turn to Freebody and Luke's framework (2003) which identifies four repertoires of practice that students need to practice successfully: code breakers, text participants and meaning makers, text users and text analysts. This is relevant to the transcript and helps us understand some of the reasons for the problems the students faced in so far as they had not been able to successfully practice some or all of these repertoires.

Another aspect of language raised by the teacher in earlier lessons, Chapter 5 (p. 190) was that of "the language of science". Unsworth (2001) addresses the range of literacies and subject specific literacies in school learning. The task set for students in this transcript can be identified as 'to explain why an abstract and/or not readily

observable process occurs' and 'to introduce and illustrate a theoretical principle'(Unsworth 2001, p. 125). He categorises these genres as 'causal explanation' and 'theoretical explanation' respectively. He concludes that only when students understand the structure, purpose and grammar of the various 'genres' will they '... be in a better position to both understand and critically interpret texts, to create and manipulate texts and combine elements in a purposeful way' (Unsworth 2001, p.127). The creating, manipulating and combining elements for a purpose is essential to creative learning and again this transcript demonstrates the degree to which they occurred and the results in terms of learning.

Before considering the social, creative and learning aspects evident in analysis of this transcript, it may be helpful to look at one typical attempt, in full. A complete transcript and teacher reflective annotation at the time, with learning codes inserted, can be found at Appendix (5).

C (reading from notes)

1. What happens is because sodium has only one negative charge on the outside shell and chlorine has seven, you need eight electrons to make an outer shell.
2. The electron on the outside of the shell of the sodium jumps the chloride to make the shell have 8 electrons on the outside.
3. The sodium has 8 electrons on the second shell so it doesn't matter when the outer shell goes away. After this occurs it is unable to have a reaction as the electrons on the electrons on the outer shell are gone.

1. *Loses way grammatically in first sentence*
2. *Lack of differentiation between chlorine and chloride*
3. *Use of word 'jumps' (from teacher) is unhelpful (?)*
4. *Use of homely phrases like 'doesn't matter' is unhelpful (?) Or is an alternative too abstract at this stage (?)*

C (explaining without her notes)

1. Mmm – what happens is there's the atoms of chlorine and sodium and on the chlorine there are 7 atoms.

2. Well, there – sodium has one electron on the outside and it jumps to the chlorine when they're put together.

3. Then because the sodium has 8 electrons on the second shell mmm that's the outer shell, and they can't have any reaction because it's therefore (?) (Unclear)

1. *Terminology varies uncertainly. Atoms used rather than electrons (or charges) on the outer chlorine shell.*

2. *Phrase 'they're put together' not concise and may hide lack of understanding of the process.*

This example, while that of one student, is illustrative of the overall nature of the responses which are analysed in detail below.

Comments (social, creative and learning elements).

6.2.1 The question

The first focus question was:

Is the concept understood when spoken from their written notes?

- Despite reading from notes students still often lose their way grammatically. Two examples, taken from many, are:

When they combine, one substance that has under 8 electrons on the outer shell and one that has almost 8 charges on the outer shell, with sodium having one and chloride having 7, so the last one from sodium goes to chloride and they create one other substance which is salt, sodium chloride (K).

All right, so well, basically, the sodium – mmm – has like – mmm – a charge of 11 and it has 2 on its inner shell, 8 on its outer and one on its outermost shell and then the chloride has a charge of 17 – 2 on its inner, 7 on its outermost shell (M).

These sentences underscore Unsworth's concern that students need to learn how to write in a variety of subject specific genres (Unsworth 2001, p. 125). One such genre is causal and theoretical explanatory writing. The students also need to be taught to write notes for speaking purposes. This could be done in both science and English and lessons. Such writing was not appropriately taught prior to this task. The grammatical inadequacy also denotes and displays the absence of making meaning as referred to by Vygotsky (1962 pp. 99-100). This meaning making is also indicated as a necessary practice of the literate and numerate person by Brown & Hirst (2005, p. 30) and Halliday (1975), in Chapter 3 (p. 94), who describes text as being '... made of meanings, and encoded in wordings, soundings and spellings'.

- Confusion from most regarding specific words denoting attributes and scientific language and the 'lexical ambiguity' referred to by Zevenbergen (2001, p. 22). One example is:

So, the sodium, when they come together, the one on the sodium will jump over to the chloride making a charge of 18, I think, and filling the space, so there's no more space left, and the sodium and the chloride, the bad ones, like apart they hurt but together they're good, since there's no more room to, like for any other charges, there's no more – mmm – there's no reaction to people. Yeah, I reckon that's it (M).

Learning new words, scientific concepts or new ideas is best done via prior knowledge, linking old and new and using current understanding and words. However, the scientific terms do finally have to be able to be used accurately for future science learning, participation and use. This bridge was rarely made by students in this transcript. The following example comes closest:

When they combine, one substance that has under 8 electrons on the outer shell and one that has almost 8 charges on the outer shell, with sodium having one and chloride having 7, so the last one from sodium goes to chloride and they create one other substance which is salt, sodium chloride (K).

- Frequent use of "nasty" and "nice":

When 2 nasty substances, e.g. sodium and chloride, combine they make a nice substance (K).

'Nasty' and 'nice' were used by the teacher. Teachers need to take care that metaphors or images are appropriate or let the students find their own imagery to better represent the knowledge to themselves and others. Creating imagery for themselves, rather than passive reception of teacher terms, would also stimulate their brains by making new connections and thus increase their learning, see Chapter 2 (pp. 56-57) (Greenfield 2003).

- Use of anthropomorphic or simple everyday words for scientific processes.

The sodium has 11 positive charges and 11 negative charges so it's all evened out but on the outer ring it only has one negative when it could have 8 so it's all alone and it becomes "nasty" (R).

Perhaps what is needed is explanation in every day "homely" language where possible and an explicit learning of "scientific" words, if they are necessary, so that the students are genuinely building on what they already know but going further in knowledge and understanding. This is what is done when refining experience and articulating it in English and drama. They too lead to abstraction or generalisation. The everyday words are again in this example an important bridge into new understanding but should be able to be dispensed with when new learning is complete unless warranted by a particular context or audience.

- The use of fill in and verbal planning phrases is a natural way of speaking when we need time to search for the best expression of our ideas or when we are talking our way into understanding. They still appear in some of the students' explanations despite preparation:

This one kind of like moves or jumps across to the chlorine which has got the empty space on the outer shell and because they are all even, with 8 negative electrons in each outer shell...ring thing, they're non-reactive 'cause it's like all even and the sodium and chlorine, their (they're) ions, become, - sodium's got one positive charge and the

chlorine's got one negative charge and it's actually – turns into sodium chloride which is salt (J).

They can be eliminated with greater preparation, practice and understanding.

6.2.2 The concept

Is the concept understood when speaking afterwards without notes?

The premise behind this second task was to see if the students, after thinking, listening, writing and talking, had finally understood the concepts; that they were theirs to further manipulate and build on. The task also served another purpose:

... that if a student could express verbally the concept that was being learnt (in their own words, not as a regurgitation of the teacher's explanation) then there would be a window on the neural connections being made during the learning process. When the teacher could see that the student's explanation accorded with the concept being taught, then there would be evidence of understanding. More importantly, if there were evidence of misunderstanding then remedial action could be taken then and there, not after disengagement had begun and the topic test been failed (McCarty 2009, p. 5).

- Some were better without notes, more fluent and with some improvement in meaning. There was also some indication of editing:

1. Yeah, OK, well you've got sodium which has a charge of 11 and on its outermost shell it's got one – mmm – charge. And the chloride which has a charge of 17 so it's got 7 on its outermost shell.

2. When they come together the one charge from the outer shell sodium jumps over to the chloride filling up all the space around it so it's got no more room for any more charges and makes it nice, the two charges making it nice, which turns it into sodium chloride (M).

Finding your own words and talking your way into understanding was a desirable process but in this case couldn't go further because of initial unclear explanation.

- Almost all continued to use the same inaccurate words and phrases and fill in clauses that were evident in initial explanation with notes.
- The two students who either had no notes or didn't use them produced the shortest and most inaccurate explanations suggesting that the writing and using of notes may have helped to a degree.

1. There's sodium and there's chlorine and they're both "nasty". And the sodium has an outer shell and it's only got one atom there and it doesn't need it and chlorine has got an outer shell and needs one more, so sodium passes the atom to chlorine which fills that up and it loses its outer shell which makes it sodium chloride which makes it "nice".

While their lack of success may be explained by their stage of brain development, it is more likely that it emanated from learned male culture, attitudes and behaviours in school, learning and science. This often presents as "cool" disengagement with learning. Its opposite would be viewed as "nerd" like and to be avoided.

6.2.3 The language

How does the language change? Does it matter?

- The language did not change significantly.
- The language might have changed more radically and importantly if during the process the students had:
 - Begun the learning with the big picture, the exciting story, the jig saw of which atoms and bonding are a part Chapter 2 (p. 37) (Jensen 1998).
This suggestion has also been made informally by Professor Martin Westwell; he suggests that perhaps science should be taught starting with the big picture [story] and then go on to analyse the parts as we do in real life when we come upon a new concept.
 - Talked more to the teacher and in small groups with the purpose of trying to understand Chapter 5 (p. 160) (Dixon 1974).

- Had help in making the transition between the new concept and the new words from former knowledge and approximate words and phrases; the teacher has a role to play in structuring this discussion, Chapter 3 (pp. 92-93) (Barnes 1976).
- Encouraged to ask questions themselves and find the answers in small cooperating groups in Chapter 1 (p.15) (Mumford et al. 1994).
- Had had the opportunity to reflect on and apply the new knowledge to their own initiated, albeit simpler, problem, providing internal motivation, Chapter 2 (p.40) (Amabile).
- Presented the knowledge as a creative product in a way they thought would work to the whole class using any aids they wished, leading to a measure of analysis and synthesis, Chapter 1 (p. 15) (Sternberg & O'Hara 1999).
- The language mattered because without it new learning, 'novel constructions', could not occur, Chapter 3 (p. 81) (Chomsky 1972).
- While the teacher can say there is not enough time for a creative process, the result is that the curriculum is "done" but the science not understood.

6.2.4 Absence of creative teaching and learning.

This transcript records an attempt to improve a particular aspect of learning in Year 9 science. The hypothesis being tested was that students would understand a certain scientific concept better by saying it in their own words than by answering a written question in a test. The findings are described above.

It is unclear what the purpose of the original learning exercise was. Firstly, there is the idea that atoms of different elements can combine chemically to form a molecule (compound) that may have very different properties from the original atoms. This is the origin of the "nasty" sodium and chlorine forming "nice" salt, in the words of the teacher.

Then, without naming it, the concept of 'ionic bonding' is introduced. This involves two further ideas, but only one is dealt with, the formation of 'ions', atoms with atomic numbers (protons and hence electrons) close to the inert or noble gases, may lose or gain electrons to establish a chemically more stable outer electron shell. Atoms that

lose electrons become positively charged ions; those that gain electrons become negatively charged ions.

It is the attraction of these oppositely charged ions for each other that results in new compounds through Ionic bonding, but this step appears to have been omitted.

The full story was not told, so what has been told doesn't make sense.

Although there was some purpose and a product, necessary for creativity and transformation of ideas, they were very limited. Most of the processes required for creativity were absent. There was no excitement engendered by the task, there was no genuine intention to find information, understand it and show it in a product. There was little group cooperation or learning from other sources than the text book. The students had no authentic or engaging purpose driving them to transform the information in a creative way. There was little evidence of 'double-loop' learning with its generative learning and transformational change, Chapter 2 (p. 33) (Argyris 1990). The notion of 'saying' the ideas' was not enough on its own.

Without doubt, the ability to interpret word problems is necessary for functional numeracy and the understanding of scientific concepts, but it would be made easier and would lead to the next step of understanding if the students were able to create the questions for themselves. In creating the question the students would have to operate on the elements of a concept and reassemble them in a new form which has meaning. This imaginative leap of creativity, Chapter 1 (p. 24) (Einstein 1938) (Webster 2009), is a real test of understanding and establishes the concept as the students' own, not as a teacher-given task requiring only a relatively passive response. In the words of McCarty (2009 p. 5) 'Problem solving is good, but problem setting and solving better'.

In addition to the pedagogical issues raised above, there is again the significance of youth culture on learning manifested in the boys' apparent lack of effort with the oral test and the overall student antagonism to learning science. We also saw earlier, again with this same class, the success of reframing the curriculum and the pedagogy to include activities relevant to the students and also appropriate for the learning. These were the presentations on vitamins which ranged from humour and cartoon to story.

The Department of Education Employment and Training (DEET) “Science in Schools” (SIS) Research Project (2006) made some similar observations to those contained in the reflection above. An excerpt is included at Appendix (6).

6.3 Year 10 drama discussion images and exercises on racism (August 2004, double lesson, one hour forty minutes, in the drama room).

Description (as participant observer).

This lesson is about “racism”. It arose from the social issues chosen by the class, “racial prejudice” and “discrimination”. They explore the social topics they choose, improvise plays around them and act parts of scripted plays which deal with related issues. “The Merchant of Venice”, for instance, could be relevant as a scripted play about racial prejudice.

The lesson takes the following form: firstly, the students call up an image of discrimination, and then choose a racist phrase. These pictures and words are then discussed at length by the whole class in an effort to define the concept. Secondly, the understandings are transformed into drama through three group freezes, two of which break into movement, one overt and the other subtle but both conveying racism. It is the opening lesson for the rest of the term’s work. The full transcript is at Appendix (7).

Comments (social, creative and learning elements)

6.3.1 Learning and connecting.

A strong learning element seen in this transcript is that of moving from the particular to the general through discussion:

S: About racism, when I was living in Queensland there were lots more Aboriginal people who were racist against whites and as soon as I came down here I noticed it had turned around and I was disgusted because some of the words people were using I’d never heard before and a lot of people down here are racist against Asians.

This process is described by Britton (1972, p. 114), ‘the movement in words from what might *describe* a particular event to a generalisation that might *explain* that event is a journey that each must be capable of taking for himself (sic) – *and that it is by means of taking it in speech that we learn to take it in thought*’ (original emphases). This process and its importance in higher order thinking has been referred to elsewhere in this thesis, Chapter 2 (pp. 62-64) (Greenfield 2001); (Damasio 2006); (Torey 1999); (Bloom 1956). As the students go through this process, their individual contributions become longer as they formulate and qualify their new understanding:

S: I know because where I use to live everyone called him “boong”, his real name was Thomas Wiese but everyone called him “Weasel” and he had a bike and he use to ride it round because he was homeless and he use to go to University and learn and had college degrees and everything like that and he had lots o money in the bank and had a big house – lots of cars and everything and he had...

T: Was he an Aboriginal?

S: Yeah, and then I don’t know what happened but someone started saying like about him, he was abusive to his kids and he wasn’t and it was a white person who said it and then he was, the police took all his money away and he wasn’t allowed to touch it, so he was left homeless, on the streets, because of one person’s...

T: They were more likely to believe him (white man) because he (Weasel) was black?

S: Yes.

The exception to this ability to move from concrete description to generalised explanation was the Year 7 student who was the only one to remain in concrete mode. He was still telling racial jokes while the other students had moved on to analysing their purpose and nature: abstract, generalising concepts. Since he was 12 years old and the other students were 15 it may have been that there was less ability for abstraction as Blakemore and Frith (2005) suggest, see above Chapter 2 (pp. 46-48).

Another characteristic, perhaps taken for granted, is that students can provide illustrations from a film or story in a succinct manner to make a point in discussion. This ability to recall, categorise and generalise succinctly is not shown by the Year 7 student in the class:

S (Yr7): I like Indians; Indians are awesome!

T: Ah, American Indians, is that what you mean?

S: Yes, because we saw a show ...

(tribal Indians and American settlers are described and the class gets restless at this long retelling of a film).

This extract exemplifies the different mental process and learning stage of a younger student. At around 12 years old, and younger, students frequently tell the whole of a seen or heard story rather than being able to pick out the relevant bits to support their point. This student is also still in the concrete stage of what he saw rather than abstracting from it.

Furthermore, throughout the transcript we see connections being made by the students in relation to their past and current experiences as well as those of others made in the discussion. This is an example of building on prior knowledge and making cultural connections. Groundwater-Smith et al. (2001, p. 185) make this observation in relation to building literacy in the classroom:

... help students make connections among the knowledge and issues under consideration with what else they know and understand, including making cultural connections. If students begin to understand the connections between one area and another, they are more likely to take on board the new area of knowledge.

6.3.2 Imagery.

I want to begin this afternoon with you closing your eyes and seeing a PICTURE (LI2) of racial discrimination and I want you to hold that picture and we'll go round the circle and I want you to describe it to the rest of the class.

Imaging, or calling up the image, in this lesson is a process which is frequently used. Blakemore and Frith make the point that calling up an image is easier when the referent is concrete rather than abstract (Blakemore & Frith 2006 p. 156). The referent here is an abstraction being made concrete by an image so that it can be talked about as something real. The images produced were:

A black person walking into a restaurant, it's empty and they only go, 'Sorry, not very well prepared tonight.'

S2: I've got a white person walking down this like alley way and these black people come up to him.

S4: So, it's like a jewelry store or something, a black person walks in. They don't get any help from anyone. A white person comes in and they do. Like they said, 'Can I help you sir?' and that.

S5 (F): I see a little girl at school and she's like Asian and she's got no one to play with because she's different to everyone else.

S6 (F): I pictured like, you know how you can get those 'mail order brides'? Yeah? Some of them get put into brothels and because they're ethnic girls they get treated really bad.

S7 (F): I saw a little boy and girl being pushed around because they were a different colour or race being hassled by other people.

S8 (F): I saw people coming to Australia, trying to speak a language and there were people laughing at them when they don't get it right. It happens.

These images, and later the racial, spoken phrases, are varied but begin to throw up some similar characteristics based on difference and degradation.

S1: Because they are always putting people down.

T: So essentially you're saying racial prejudice is putting people down?

S1: Yeah, making them feel small.

S3 I've heard people say 'Fuck off you bung' to Aboriginals.

S3: I've heard 'Fuck off you black coon.'

S4: I heard laughter.

S5 (F): I heard 'black bung' or something.

S6 (F): Yes, I just heard people laughing.

S7 (F): Yes, all those individual names but like after 'black'. It's always 'black' something.

S8: Dirty, filthy because of their colour.

S9: I've heard them called 'druggies' and just stuff like that.

S10: Get out of here you fucking gook.

T: Gook, what race would that be?

S10: Asian.

S11: Black, just like anything black sounds like black – black bastard.

S12: 'Towel heads', 'June boons' and ...

S12: 'Towel heads' that hat thing and 'June boons' cause they live in the sand.

T: Why is it 'June boon'?

S12: 'D u n e c o o n'.

T: Oh, so it's 'dune coon'? Right.

The teacher asks the students, explicitly, to interpret the images and phrases, 'We have to work out why, what – what this is all about, why those words? What have they got in common? Why those pictures? Why did we choose those? This is a key aspect in learning and greater understanding including categorising and generalising from their own and others' particular references. We are constructing a framework or generalization in order to understand a phenomenon and to continue to understand it adding more examples as we grow, possibly redefining it on the way. This has some similarity to Freire's using the image of the vase of flowers to move from concrete to abstract thinking for cultural and political understanding. In addition, Blakemore and Frith refer to research which indicates that the image called up is felt in the perception almost as much as the original would have been and that as such imagery is a powerful tool for learning. Torey and Damasio also share this view in relation to learning, Chapter 2 (p. 54-55) (Torey 1999); (Damasio 2006).

6.3.3 Teacher role.

The role of the teacher in this lesson .as has been noted before in Chapter 5 p. 138 (Barnes 1976) is influential in the quality of the discussion. She shares experiences just as she expects the students to,

'What we're saying is it's 'black 'in Australia but when I was in Africa there was a word for a white person which was derogatory, yuk, 'mzungu', that meant white, 'mzungu', a Swahili word.

She also makes the contributions she asks of the students,

I'll count 10, so I can find my picture as well.

1 ... 10 (Vocalised 1 to 3 then silence for rest of count)

The roles of the teacher include:

Scaffolder, she has planned the movement from image to word, to discussion and generalisations.

Navigator, leading the way, through key questions like 'Why do some people call themselves black?'; 'Jokes are used for what purposes then?'; 'Why do you think Australians overall seem to be more prejudiced against Aboriginals?'

Confidence builder, including comments such as 'very good', 'fantastic', 'perfect', and '... a very good example, thank you'.

The students are taught creatively and for creativity, Chapter 2 (p. 73) (NACCCE 1999). The small amount of acting they were called upon to do in this introductory lesson was certainly innovative:

The first one was showing gross sexual discrimination and assault. This freeze was very strong using their hands to pint, poke and hurt. There were fists snarling looks and so on.

The second was a medium form of discrimination where people deliberately turned away, moved away and even spat.

The third was the subtle sort of racial discrimination which can occur and this was just the blink of an eye or in one case it was just moving to take up a seat to make sure somebody didn't sit next to you.

The students knew that this would lead eventually to public performance.

The relationship is one of trust Chapter 2 (p. 72) (NACCCE 1999). For instance, in the lengthy contribution from one of the students on 'Filipino brides', the assumptions and assertions have not been tested; there is no evidence; they are hearsay. They could be easily challenged by the teacher, as could much of what is said in such discussions. The result of this would be disinclination on the part of students to speak at all and to bring out such important matters in open discussion. It takes considerable trust in the

teacher/student relationship for this talk to be going on at all. Without it the hearsay remains unexplored and ill defined. The student's own language and that of the others is shaping what is thought and in some students forming an important framework, generalisation or coat hanger from which to think, speak and act. It cannot be a didactic discussion and whatever is said has to be considered, not punished or ridiculed.

The lesson was about the cultural phenomenon of "racism". The students' view points although varied were also redolent with social and culturally learned attitudes. Their discussion, and the images they created, revealed a shared and growing understanding, in most cases, of the concept of "racism".

The learning was largely through discussion, reflection, imagery and empathy but their willingness to discuss and their engagement, I think, derived from the dramatic purpose and product on the issue which they had chosen – racism.

6.4 Tabulation.

In the 'Data Display' section of my qualitative research methodology, I said that I would test data in relation to creativity characteristics and learning as a way of gradually 'reducing' the material; transforming it through selecting, focusing, simplifying and abstracting.

I have attempted this reduction through Tabulation and a Scatter Plot graph. Clearly, the number of variables which include observer perceptions, student differences and changed circumstances make the results indicative rather than definitive. They provide a landscape rather than a map.

The tables below indicate the frequency of creative and learning characteristics in five lesson types and three transcripts.

Table 2: Lesson Data Analysis – Learning Characteristics

Subject		Drama										Performance				English				Mathematics		Science				Transcripts			Total
Lessons		1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	1	2	3	4	1	2	1	2	3	4	1	2	
	Code																												
EXPERIENCE																													
(Building on)	LEX1					1			1				2	2		1					1								
CONNECTING																													
	LC1	1		1		1	1						1	4		2								1			1		1
EMOTION																													
Humour	LE1		1			1			3			1	1		3	1									1				
Empathy	LE2		1				1									2		1									1		1
Engagement	LE3	1	1	1	2		1	1					1	1		1	1	1	1	1	1	1		2			1		1
Confidence	LE4						1			1			1												1				
Relationships	LE5										1																		
Trust	LE6			1			1																						
Excitement	LE7			1									1					1									1		1
LANGUAGE																													
Discussing	LL1	1	2	1		1	2	1					2		2		2	1		1	2	1		1	2	1	1	1	1
Criticising	LL2			1													1										1		
Narrating	LL3	1	1		1					1			1			1					1			2	1		1		
Thinking	LL4	3	1	1	1	1	1							1		1		1	1	1	2	1			1	1	3		1
Reflecting	LL5		1	1		2	1						1	1				1		1				1	1		3		2
Writing	LL6													1	1		1		1	1		1	1		1	1		1	
Reading	LL7			1										1	2	1	1			1	1		1				1	1	
IMAGES																													
Patterning	LI1	1			1													1	2	1	3	1			1				
Imaging	LI2	1	1			1		1								1	1			1								2	
Imagining	LI3	1	1										1																
Lesson Totals		10	10	9	5	8	9	3	4	2	1	1	12	11	8	11	8	6	5	9	11	5	2	7	9	3	14	3	10

Table 3: Lesson Data Analysis – Creativity Characteristics

Subject		Drama											Performance				English				Mathematics		Science				Transcripts			Total
Lessons		1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	1	2	3	4	1	2	1	2	3	4	1	2	3	
	Code																													
ORIGINAL/NEW																														
	CO		2			1		1					1	2	2		1				2	1			1		1			16
IMAGINATION																														
	CIM					1			3					1		1									1		1			8
PURPOSE																														
	CP	1	1	1	1		1	1	1				1	1	1	1	1	1	1	1	3	1			2	1	1	1	1	25
PRODUCT																														
	CPR	1	1	1	1		1	1	1		1	1	2	1	1	1	1		1	1	3				1	1	1	1	1	25
MEANING/SYMBOL																														
	CM	2	3			1	1	1	3				1	4	2	1	1	2	1			1				1	1		26	
EMOTION																														
	CEM						1									1														2
TRANSFORMATION																														
	CT	2	2		1	2		1	3				2	3		1			1	1							1		20	
COOPERATION																														
	CCO		2		1	1					1		1	1	2	1			1						1	1	1	1		15
Lesson Totals		6	11	2	4	6	4	5	11	0	2	1	8	13	8	7	4	3	5	3	8	3	0	5	4	5	7	0	2	

Table 4: Lesson Data Analysis – Learning and Creativity Characteristics Totals

Subject	Drama											Performance				English				Mathematics		Science				Transcripts		
Lessons	1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	1	2	3	4	1	2	1	2	3	4	1	2	3
CREATIVITY Scores	6	11	2	4	6	4	5	11	0	2	1	8	13	8	7	4	3	5	3	8	3	0	5	4	5	7	0	2
LEARNING Scores	10	10	9	5	8	9	3	4	2	1	1	12	11	8	11	8	6	5	9	11	5	2	7	9	3	14	3	10

TABLE 2 LESSON DATA ANALYSIS - LEARNING CHARACTERISTICS.

TABLE 3 LESSON DATA ANALYSIS - CREATIVIITY CHARACTERISTICS.

TABLE 4 LESSON DATA ANALYSIS - LEARNING AND CREATIVITY CHARACTERISTICS TOTALS

They show:

- Low frequency in three unsuccessful lessons and one transcript.
- High frequency in all the remaining lessons and transcripts but to varying degrees.
- The high and low frequencies occur across the subject range.
- The characteristics of engagement, purpose and product appear in all the remaining lessons
- The characteristics of thinking, discussion, meaning and transformation also figure highly.

This reduction is valuable in two ways: it sharpens the focus but at the same time, paradoxically, reveals the complexity of the creativity and learning which is being analysed. For instance the two words ‘purpose’ and ‘product’ which appear so constantly contain within them the important processes of: hypothesizing, enquiring, problem posing, overcoming problems, preparing, trying out, finding out, incubating, executing and making mistakes. While some of these processes are identified as ‘learning characteristics’ they are also specifically ‘product’ processes.

Any template for a creative pedagogy would need to identify these processes within purpose and product and recognise their inter-relatedness with the other creative and learning characteristics, particularly, it appears, that of engagement.

The total scores for Creativity Characteristics and Learning Characteristics for each individual lesson were incorporated on a Scatter Plot for the whole data set. (FIGURE 1 LESSON DATA ANALYSIS LEARNING/CREATIVITY CORRELATION PLOT).

The results show wide variation, with some notable outliers.

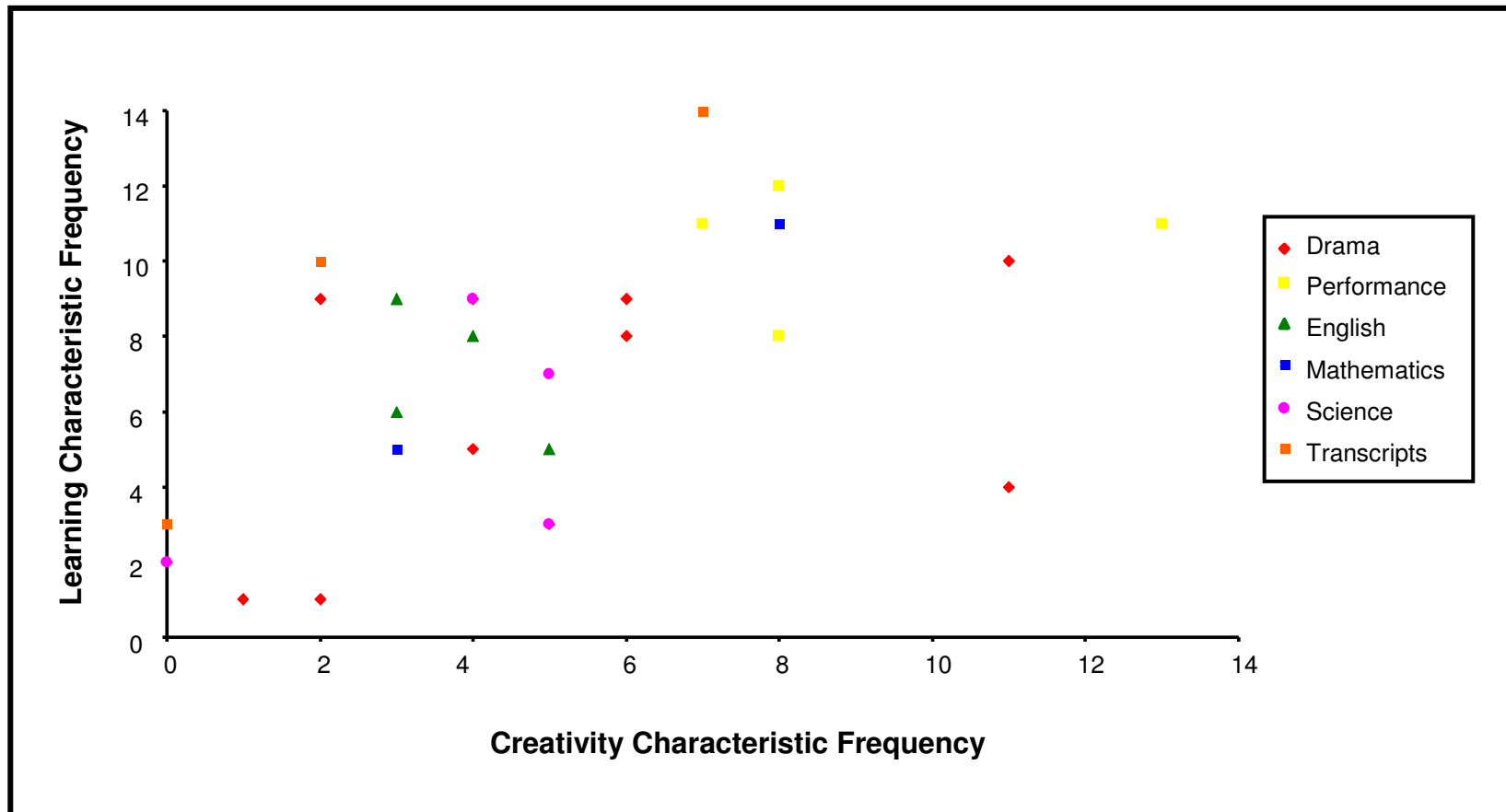
The outliers represent Drama lesson 8, Transcript 1 and Transcript 3. They are outside the trend of balance between creativity and learning for different, specific reasons but their position on the graph makes a valuable general point.

Drama 8 is high on creativity characteristics (11) but relatively low on learning characteristics (4) because it was an extract of a lesson in relation to a specific drama skill being learned; not all of the learning process was therefore seen. Transcript 1 is very high on creativity (7) and also extremely high on learning characteristics (14) because this is a transcript of a full Year 9 lesson with many and varied activities in which both learning and creativity can occur. Transcript 3 is low on creativity characteristics (2) and high on learning characteristics (10) because although this is a full lesson it is spent entirely in discussion in preparation for the creation of a play. The reason that the discussion can be this long is two fold: these are Year 10 students who can sustain this length of time; unlike Transcript 1 this is part of a project over a few weeks not one or two lessons.

In summary, the variations in balance shown on the scatter plot graph depend on the length of the programme and the age of the students.

However, and most importantly, a general trendline is clearly discernable – as the Creativity characteristics identifiable in a lesson increase, so does the variety of Learning characteristics.

Figure 1: Lesson Data Analysis – Learning/Creativity Correlation Plot



PART 2

CHAPTER 7

INDIVIDUAL AND CLASS QUESTIONNAIRES AND VOLUNTARY OBSERVATIONS

Further reduction of data, as described in the qualitative research methodology, can be achieved by summarising, clustering and teasing out themes from observations and responses to questionnaires. The raw data was translated into percentages to permit comparison of different sized samples. Tabulation is provided in the form of a table of results and a bar graph using data reduction notation in relation to teacher attributes and techniques. The latter are relevant in the application and transferability of a creative pedagogy.

The questionnaires were devised to examine key aspects of creative teaching and its effects in terms of the variety of language use, reflection, product, confidence, student configuration and the relationship between the students themselves and the students and the teacher. The relative importance of relationships was demonstrated in the tabulation exercise. The particular features of those relationships are obviously important components in the process of teaching and learning creatively. They will be included in the later application of the results of the research and data collection into a pedagogical framework.

One questionnaire was for students and the other for adult observers. Two different questionnaires were given to two whole classes. Four additional observations were voluntary and not as a result of the survey but have been reported here under the headings used in the questionnaires. These four observers are described under section 7.2 'The Respondents' (pp. 224-225).

The questionnaires provide data outside my own observations and experiences. The learning and teaching have been perceived from quite different vantage points. All of the responses are covered whether positive or negative. The degree of mutual consistency and difference are considered as well as the extent to which the perceptions

are congruent with the learning and creative characteristics already defined. Where other features arise which are unexpected they are considered in the implementation of a creative methodology.

7.1 The Questionnaires.

The questions for both adults and students ranged across those areas of learning which are pertinent to this thesis, namely:

Student confidence in learning

Creative behaviour

Language range

Students' physical formation as it relates to cooperation and creation

Relationships between students and students and teacher

Product as a driver of learning

Teacher characteristics

Possible replication of lesson

Use of space

Other

The questionnaires were:

Questionnaire (1) adult observers

(For use in PhD Thesis by Clare McCarty)

1. Did you notice students behaving confidently? Please give example(s)
2. Did you notice any creative activity by individuals or groups? Please give examples.
3. Was there a period of reflection by students at any point in the lesson(s)? Please describe.
4. What kinds of language were used by students in the lesson – narrative, planning, recalling, instructing, deducing, conceptualising or any others? Please describe.

5. What formations did the students work in – singly, groups, plenary? Please describe.
6. What did the relationships seem like between the teacher and the students and the students and each other? Please give examples.
7. Was there a product or were the class working towards one? Did this seem to affect their behaviour and learning? Please describe.
8. What characteristics did you note about their teacher? Please list.
9. Do you believe these lessons could be taught in this way by another teacher or yourself? If not, why not?
10. How was space used by the students? Whose decision was this?

PLEASE LIST OR DESCRIBE ANYTHING ELSE WHICH YOU OBSERVED THAT WAS NOTEWORTHY

THANK YOU FOR TAKING THE TIME TO RESPOND TO THIS SURVEY.

Questionnaire (2) Students

(For use in PhD Thesis by Clare McCarty)

1. Does doing Drama give you more confidence? If so give an example.
2. Have you found Drama or English a creative activity? If so give an example
3. Do you recall reflecting on what you learned in Drama or English lessons? If so what do you think your reflection achieved?
4. Did you talk a lot in Drama and English lessons? Could you define some of the different kinds of talk? Do you think it's important to talk when you are learning?
5. Did you work individually, in groups and as a class in both Drama and English? In what ways was this valuable?
6. How would you describe the relationships in the classes between yourself and the teacher, the other students and the teacher and yourself and the other students?
7. Was there usually a product that you were working towards in these lessons? Did this affect how you and the other students learned in any way? Did it affect behaviour? Give an example.
8. What characteristics would you say your teacher had? Please list.
9. Do you think another teacher could have taught you in the way she did? If yes: why? If no: why?
10. How was space used in these lessons? Who decided?

PLEASE LIST OR DESCRIBE ANYTHING ELSE WHICH YOU OBSERVED THAT WAS NOTEWORTHY

THANK YOU FOR TAKING THE TIME TO RESPOND TO THIS SURVEY.

Questionnaire (3) whole class: Year 10 Drama.

Q.1. Describe three or more things you have learned in drama this term.

Q.2. Why do you like drama lessons? What things do we do that make you like it? Give as many reasons and examples as you can.

Q.3. In what ways is drama different from other lessons? Think of as many as you can and give examples.

Questionnaire (4) whole class: Year 9 Drama.

Q. Why do you like learning drama?

The only difference between the first two questionnaires was in the formulation of the questions. Both sought personal views but the adult one those of an observer and the student one those of a participant. The two whole class questionnaires were shorter and simpler relative to the age groups concerned. They were filled in at the end of the class period.

All the questionnaires were given and returned during 2005. They are displayed in full and annotated with codes based on attribute frequency in the Appendix (8).

7.2 The respondents.

The questionnaires were used as a means of seeing the learning experience, where I was the teacher, through the eyes of the participants (students) and observers (adults). The adults were familiar to the students since they were either School Services Officers or, in one case, a pre-service teacher who had been present in lessons for some time. The adult and student questionnaires were completed in the recipients' own time whereas the class questionnaires were immediate responses at the end of a lesson.

Observations were provided by a Year 11 male student with learning and personality difficulties in some areas who was in the lessons as part of a “Community Studies” course. His role was to assist me in various ways including filming rehearsals and productions. He asked if he could write his observations of what he experienced in lessons. A female School Services Officer (SSO), who was present in drama lessons, and who had once been a drama student at the school, also chose to write her own views. One male and one female student, to whom I taught English early in my career, also offered recollections of their experience.

The students were chosen to include differences in ability, year level and gender. The adults were chosen because they were conveniently there.

The two contemporary views provided outside the survey were pertinent to several of the topics in the questions.

The two views provided from the past provided a rare opportunity not only to gauge the methodology against students in a different time and place but also to ascertain whether what they had learned really had made any difference to their lives given that they are now 46 and 55 years old respectively.

7.3 The Responses.

7.3.1 Adult responses.

These responses ranged from the short and almost practical to lengthy and reflective.

7.3.1.1 Creativity and confidence.

Creativity and confidence were described in detail:

When this creative level is achieved, transfer occurs. This transfer does not just take place in isolation. It flows from teacher to students and among students in rapport with each other. Confidence starts to flow as liquid energy and even to the extent of

billowing like creative wind. As a teacher, this inventive level of activity was encouraging and exciting; encouraging as a teacher upon reflection, and exciting as a participant

The students (Year 9 drama) were all without exception very confident by the end of the term. Students who have shown a lack of confidence in other areas [of the school curriculum] shone. Most students showed creativity by the end of the term

While the quotations are differently expressed, both refer to creativity and confidence as linked characteristics and that they are experienced by most of the students in the class, an example of “quantitative creativity”, Chapter 1 (p. 7) (Cropley 2001). The importance of confidence in the creative process has been frequently referred to in research literature, Chapter 2 (p. 70) (NACCCE 1999) and Chapter 1 (p. 18) (Freeman 1983). The acquisition of creativity over a term may relate to the importance of getting to know the “domain” of a subject in order to practice it well, Chapter 1 (p. 17) (Nickerson 1999).

There was reference also to passion, enthusiasm, delight, excitement, inspiration and humour. The first four of these are emotional states; arousal often accompanies both creativity and learning, Chapter 2 (p. 36) (Jensen 1998) and (Caine & Caine 1994).

Inspiration has been associated with creativity from ancient times through the Romantic period and to the present day, Chapter 1 (pp. 8-10), however, in these references the inspiration appears to come from the teacher, the content and each other’s work.

Humour noticed by the adults ranged from comedy in students’ creations, their references to humour in entertainment and humorous incidents which occur during lessons. Getzels and Jackson, (1962) in particular, make the same point that humour is a high ranking feature in productivity and rated highly in importance by the participants themselves, Chapter 1 (pp. 14-15). Neuroscience also refers to the brain development at puberty which allows irony and satire to be understood and created, Chapter 5 (p. 155) (Blakemore & Frith 2005).

The observation was also made that these characteristics were different from those found in other learning experiences. The adults referred to drama and English lessons when making these comments. My own observations have been that they can happen elsewhere in other subjects but only when there is engagement, purpose and a product, Chapter 5, lesson transcripts on Mathematics (pp. 176-177) and Science (p. 187).

7.3.1.2 Replication.

The adult views differed in their complexity and also on the question of whether or not the pedagogy could be replicated. Some saw a set of skills in operation which could be learned and used by any teacher, whereas others were unsure of this:

I have been present while other teachers have taught drama to this class and they did not have the same results.

... transferability ... the obvious answer to this question is a definitive yes.

Given its considerable importance, this disagreement about replicability will be discussed at length under the heading of “transferability” at the end of the chapter.

7.3.1.3 Additional characteristics.

New and unexpected observations included respect, affirmation, maturity of relationships between students and teacher, good student behaviour and shared leadership.

The qualities of respect, behaviour and maturity of relationships often appear together:

There were some students, who are often in trouble in other classes, behaving totally differently. The teacher treated the students with respect and dignity and had no pre-conceived ideas about them.

I expressed strong surprise at how well the class interacted. I am not sure how clearly I told you previously, but I was initially almost stunned - was very impressed - at the level of mutual respect which operated between you and your class.

The quality of the class relationships was observed in a number of ways. The maturity of relationships was one definitive factor. Your strong relationships developed with individual students were quite stark compared with those sadly too frequently experienced by students. But this quality, which I have variously termed maturity and respect, equally operated between individual students in various class formations.

This interrelationship between behaviour, respect and maturity is noted by a number of specialists in behaviour management, most notably Edwards & Watts (2004, p. 219) ‘we use our power *for*, and with, our students and not merely *over* our students’ (italics in original). Rogers (1990), too, believes that the teacher’s confidence in the students’ ability to develop and exercise independence and responsibility for their actions is best achieved if they have the opportunities to choose their work and how they conduct themselves.

Affirmation was an unexpected term. It seems to suggest a display of ability caused by a mixture of trust and confidence:

...in a manner that not only overwhelmingly affirmed and reinforced a class of Year 9 students in their ability to perform but this was then wonderfully displayed in a high level of skill frequently evidenced in the class room. The creative level displayed by many students was very high.

The quality of shared leadership, referred to below, is reminiscent of Freire’s (1987) concept of mutual learning, ‘Both gain insights – learner-teacher and teacher-learner,’ Chapter 3 (p. 93).

... one had the sense that the class was quite naturally agreeing with you with regard to the appropriate spatial forms for use. Equally, the natural converse arrangement applied. You frequently agreed with class members. You led the class but they worked with you. Their use of space reflected this.

7.3.2 Student responses: individual and class questionnaires.

In the following analysis, comments from the individual questionnaires are placed first, followed by those from whole classes. Individuals were questioned specifically under headings relating to creativity and learning whereas the classes' questions were open-ended and not specific. Interestingly, in all but two cases, 'reflection' and 'expressing yourself', the non-specific questions produced the same characteristics in the responses as those identified in the individual questionnaires. This would suggest that these issues are important in the students' eyes when they are learning creatively without any external prompting.

7.3.2.1 Confidence

Allows me the chance to take on the role of another character but build my self confidence at the same time.

It brings out confidence that I don't have in other subjects
No put downs when acting.

There are many such comments in the raw data. While they refer to confidence building, they also frequently refer to 'acting' or 'empathy' required when imagining you are somebody else, somewhere else, as providing the opportunity to be confident. The fear of personal failure referred to in Chapter 1 (p. 18) (Nickerson 1999) seems to need this character shield initially to be confident. This is underlined by the phrase 'No put downs when acting'; you are safe from ridicule. There is also commonly reference to this being different from experience in other subjects.

7.3.2.2 Creativity.

I now write many plays with my friends and on my own
We don't just do work we get to create things like building sets and designing things.

The best thing about drama is that is all about creativity
I think you learn more with hands on work than theory work

These remarks and many like them from the students have a clear practical bias. They see creativity, in English and drama, as making something; having an end product. This connection is clearly enunciated in one of the individual questionnaires as:

I believe the product I worked towards was the task at hand. In drama especially, I wanted to produce work that I thought was to the best of my ability. I'm not sure about the other students but I was constantly pouring my heart into everything I attempted in drama.

The importance of purpose and product in creativity has been repeatedly referred to in both the research literature (Nickerson (1999); Freire (1972); Harris (2006); Freeman (1983), and the data analysis, Chapter 6 (pp. 200-201).

7.3.2.3 Reflection.

It helped us to understand and learn more of what we performed.

To look at various aspects of learning on different levels and use opinions of others to reach a conclusion.

These comments link reflection with learning which is appropriate, Chapter 5 (p. 164) (Savery 2006). There is no reference to reflection in the class questionnaires. Given that these were Year 9 and 10 classes, it is probably not a term they have often come across, even though they sit in a circle the end of lessons and talk about what they have learned. They do however have a great deal to say about discussion below.

7.3.2.4 Language.

We talked about almost anything a teenager must go through. I think it's important because it helps you relate to people better.

You can share ideas and get the best possible answer.

It is valuable because interaction with others gives you a chance to learn from others and work together to produce a better product.

We talked about important issues to us and to the world and it helped us learn. It's important to talk in lessons because I'm a person that learns better by listening

These remarks in the responses represent an acknowledgement that talking helps to extend students' understanding of their current lives and the greater world beyond. The comments also incorporate languages role in cooperation, learning and product.

However, the class groups honed in on discussion in particular:

I enjoy the discussions we have. Ms McCarty will say, 'Let's have a quick discussion!' There is no such thing as a short discussion in our class because everyone in our group has a large intellectual capacity and "discussion" invites the group to contribute a piece of their mind and we have long discussions which never get boring because everyone is so 'on the mark' when discussion is brought on.

It is an excellent lesson for discussing issues and converting them into plays

... discover yourself through others' words or our own words and improvisation.

These observations also refer to themselves, to the connection between language and the product but also an enthusiasm for discussion in its own right. This is significant given its importance in relation to the development of language and thought, Chapter 3 (p. 92) (Berger & Luckmann 1967).

We are challenged; we have to really use our brain, the subject's all about problem solving.

As well as using your brain, writing was also singled out and valued in the creative context. This is worthy of mention because in secondary schools both these activities are often resisted by students.

7.3.2.5 Group work

It is valuable because interaction with others gives you a chance to learn from others and work together to produce a better product

You get the chance to voice your opinions and talk as a group that's mature

Group work is linked here with product, learning and maturity. The latter may refer to the independence this process gives, Chapter 7 (p. 228) (Rogers 1990), and the subject of the discussion which they see as an adult issue.

7.3.2.6 Relationships.

I have developed a valuable friendship with my teacher, which I hope will not end after school. It is so important to not only relate to the other students, but also the teacher.

...if I have any questions I know I can speak to Ms McCarty about it and not have her judge me but rather do what she can to help.

We get respect from Ms McCarty and she treats us like adults whereas other teachers expect us to know nothing and be stupid. Drama lets us show our maturity

The raw data on relationships shows their importance for students. Most of the comments on relationships refer to both other students and the teacher as they do here. There are again references to a dislike of being judged or considered stupid, reminiscent of an earlier comment on putdowns. In reducing this data we can certainly include relationships as significant but linked with respect. For Rogers (1990) respect is a key ingredient in all classroom interactions.

7.3.2.7 Learning.

The thing that has been concreted in my mind mostly is always to be critical and have a voiced opinion. Even when doing simple things like watching day time television, I question little things about the actors, the choreographed movements and even the people in the background

Drama gives me something other lessons cannot; you learn a lot about current issues and have fun at the same time

It improves your speaking. It helps your mind to think and spark ideas.

You learn different methods and styles of acting.

You learn more about certain issues. You learn heaps without writing a whole load of stuff.

In drama you learn by talking and telling your piece.

You are forever learning something new about yourself.

It really helps you to discover yourself through others' words or our own words and improvisation.

Through Drama you can learn most any subject.

A large number of comments have been selected to convey the particular facets of learning regarded highly by students. These refer to themselves and their identity, the importance of talk in learning and the substance of what they actually learn. Examples here are: acting, social issues and how to be critical. They refer to those things which they are now capable of doing or knowing, Chapter 2 (p. 27).

7.3.2.8 Replicability.

There were no comments on replicability from the class questionnaires. However, in answer to the specific question in the individual questionnaires all responses were strongly negative. The following quotation sums up the opinions expressed:

No, Ms McCarty was like no other teacher I have ever had. She strove to get the best results from her students in not only her school time but even in personal time

However, this and other comments will, as said, be discussed in more detail at the end of this chapter.

7.3.2.9 Issues at variance.

Two issues only were at variance between the individual and whole class questionnaires. These were, as previously discussed 'reflection' and an additional quality 'expressing yourself'. The latter frequently appeared in response to the class questions. Its main emphasis was on the opportunity to express feelings:

Express my feelings and emotions - release my energy

Speak freely and express my feelings

Express my feelings and emotions towards the topic

The emotional component in learning creatively was stressed in the research and manifests itself here. The frequent use of the word 'fun' is also used to describe 'excitement', 'enthusiasm' and 'atmosphere'. It seems that feelings are associated with both learning and social interaction in a significant way, Chapter 1 (p. 23) (Damasio 2006).

7.3.2.10 Response summary.

In summary, from both student and adult responses, there is indication of improved learning and maturity, enhanced social skills and activity, expanded confidence, emotional expression and knowledge of new concepts (including local and world issues), excitement in learning and a delight in doing something practical. An unanticipated observation common to both groups was that of mutual respect and dignity.

7.4 Tabulation.

Teacher attributes to be addressed in any template will need to match and galvanise the characteristics of creative learning by energising the process, building confidence, being critical, supporting as a friend would, treating the creators with respect and sharing in the satisfaction.

These teacher qualities are of crucial importance to the transferability of a creative pedagogy. The ten recurring most often in the questionnaires and observations are listed and coded as follows:

<i>1 Building Confidence</i>	<i>BC</i>
<i>2 Opportunity to be creative</i>	<i>OC</i>
<i>3 Opportunity to be critical</i>	<i>CR</i>
<i>4 Opportunity to talk</i>	<i>OT</i>
<i>5 Emotion/excitement</i>	<i>E</i>
<i>6 Respect/relationship</i>	<i>R</i>
<i>7 Friendship</i>	<i>F</i>
<i>8 Collaborative/Cooperative</i>	<i>CL</i>
<i>9 Passionate/enthusiastic</i>	<i>P</i>
<i>10 Transferability</i>	<i>T</i>

They have been tabulated as percentage frequency of responses from adults, students and whole classes in a table (TABLE 5 QUESTIONNAIRE RESPONSES) and bar graph (FIGURE 2 QUESTIONNAIRE RESPONSE ANALYSIS - ATTRIBUTE FREQUENCY) as further qualitative reduction.

The sample comprises 5 adults and 55 students. That there are five adults who can comment on creativity and learning in a classroom situation from an ongoing perspective, not a once off visit, is noteworthy. That this was possible results from the presence of SSOs in classes, a fairly recent situation, and the fortunate chance that a pre-service teacher spent a longer time than usual with me in my classes.

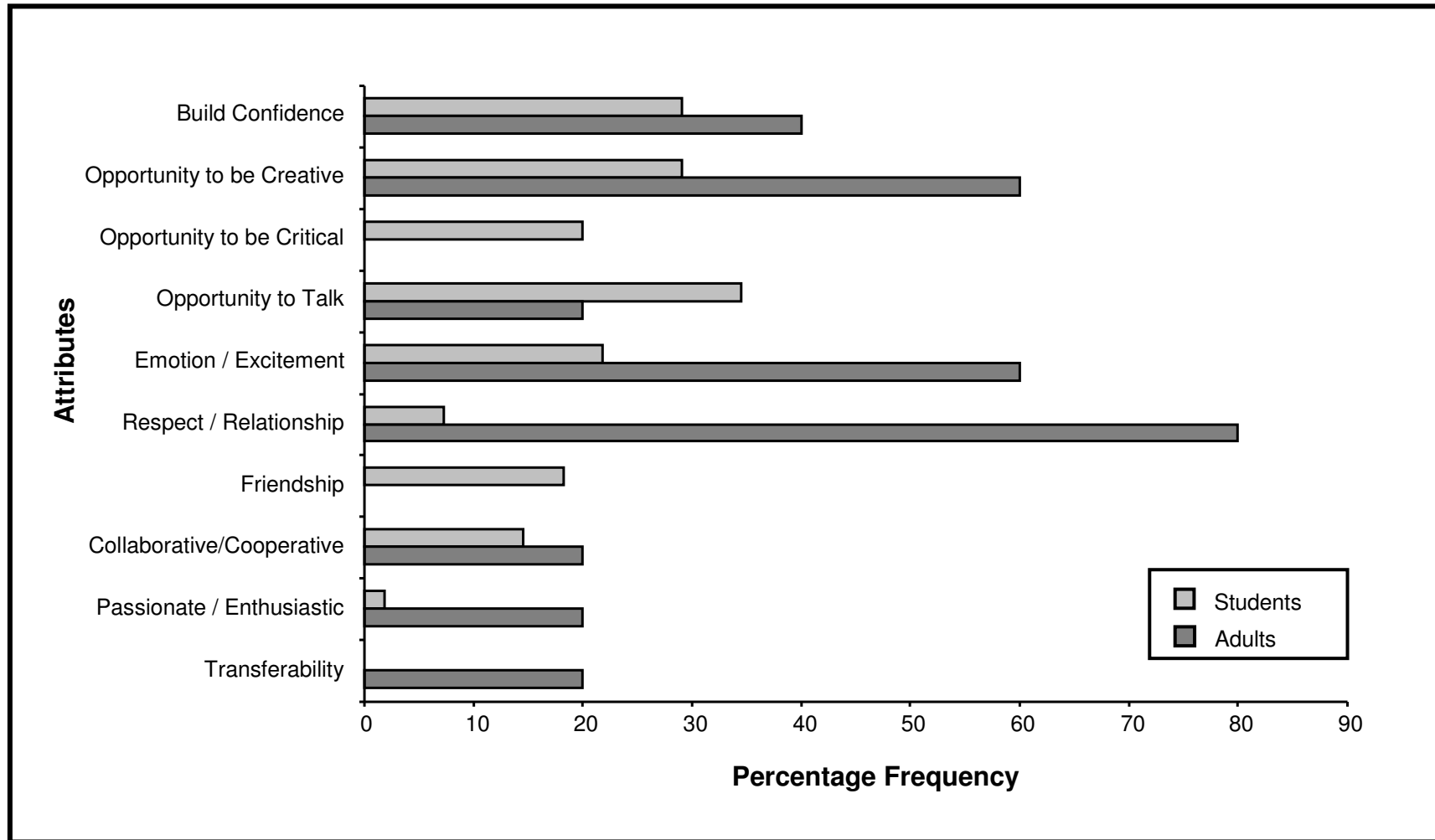
The results are reassuringly supportive of creative characteristics in learning. 'Building confidence', 'opportunity to be creative' and 'emotion/excitement' are similarly regarded in importance by adults and students alike.

However, the greatest percentage contrast is in 'respect/relationship' where adults value it much more highly than students. Students on the other hand strongly support the

Table 5: Questionnaire Responses

TEACHING ATTRIBUTES	FREQUENCY		% FREQUENCY	
	Students	Adults	Students	Adults
Build Confidence	16	2	29	40
Opportunity to be Creative	16	3	29	60
Opportunity to be Critical	11	0	20	0
Opportunity to Talk	19	1	35	20
Emotion / Excitement	12	3	22	60
Respect / Relationship	4	4	7	80
Friendship	10	0	18	0
Collaborative/Cooperative	8	1	15	20
Passionate / Enthusiastic	1	1	2	20
Transferability	0	1	0	20

Figure 2: Questionnaire Response Analysis – Attribute Frequency



teacher being their friend and friendship between class members. In some ways these are mirror images of the same inter relationship.

‘The opportunity to be critical’ and ‘the opportunity to talk’ are also viewed markedly differently from adult and student perspectives. Adults give greater weight to learning to be critical than do the students and conversely having the opportunity to talk is not explicitly prized.

7.4.1 Transferability.

It must be noted that there was a strong conflict of views on whether transferability of teacher pedagogy or attributes for creative teaching can occur at all. In the adults’ survey the School Services Officer stated:

I have been present while other teachers have taught drama to this class and they did not have the same results. However, with the same curriculum and methods used perhaps.

CM, the pre-service teacher, in complete contrast, said:

Concerning your question about the transferability of your teaching philosophy and techniques, the obvious answer to this question is a definitive yes! Logically they must be transferable. The question is how this is to be encouraged and promoted.

All the students answering the creativity questionnaire firmly asserted:

Not at all, she had more experience and patience than most teachers I know.

No, Ms McCarty opens up more than any other teachers and makes the effort to be our friend. Others don’t.

No, I have dealt with a lot of teachers and they don’t have the same approach with students.

The students answering the class questionnaires which were open-ended did not address the issue of transferability.

This raises a number of serious issues. It might be that the School Services Officer, who had worked at one school only, and the students at the school simply had not had the opportunity to observe or experience creative teaching, while CM, a mature age pre-service teacher had.

Another possibility could be that teacher personality is being coupled with the attributes of creative teaching. Obviously personality may be an issue given that there are many quite different teachers who teach in creative styles. However, one clear example of the importance of pedagogy over personality is that of my team teacher at the Parks Community Education Centre in the late 1970s and early 1980s. Our personalities were diametrically opposed, one an extravert and volatile; the other an introvert and calm. One of us was from a Science and the other from an Arts background. Not only did we work together creatively with students, we also wrote a book together, (McCarty & Rattley 1981).

What we shared was the belief in the power of creative teaching. In one of us this had been confirmed through practice and personal reflection and in the other from theory learned from university theoreticians, practice shaped by peer colleagues and continuous reflection on personal experience. These were qualities promoted by Donald Schön (Schön 1983) although at that stage we had not heard of him.

A further argument is that the pedagogy is being confused with the teacher. For the students the teacher personifies the pedagogy. When she carries out the many acts they have reported on, it's not because she is "nice" or "caring", it is pedagogy in practice. It is a set of professional skills that include subject knowledge, processes which promote learning and productive student teacher relationships. For the students these characteristics are mistakenly seen to belong to this particular teacher.

There is also another perspective. The students were asked, 'Do you think another teacher could have taught you in the way she did? From their point of view their answer is completely understandable. It could be argued that their inferences from their experiences of this particular teacher to other possible experiences are inductively invalid. That is, because they have never had this experience with any other teacher in

the past, they infer never will in the future. The students are not in a position to know whether creative teaching methods are transferable or replicable.

As Barnes (1976, p. 71) and Dixon (1974 pp. 242-247) have both pointed out, the teacher's influence on student learning is significant. The teacher navigates, structures, scaffolds, and energises. A simple example would be that of the teaching space. A confined room with desks in rows would be changed because her pedagogy requires small group discussion and report back, presentation or a product. None of this would be possible in the room described.

A creative pedagogy has a particular template which includes a number of discrete learning activities under the umbrella of engagement through purpose and product. These are transferable. CM's view that teacher creativity is replicable is one I strongly share. I also agree with his point that many additional ways could be sought to encourage and promote these skills. This is discussed below (7.4.2 and 7.4.3).

A reluctance to agree that a creative pedagogy is transferable may be that it is seen to be a philosophical stance, or paradigm, deriving from a humanist perspective and needing a persistence and commitment that is either not shared or not possible for most teachers. This is clearly not the case given the propensity for teachers to be both altruistic and hard working.

A final consideration may be that the lack of opportunity to learn and practise creative teaching is much more likely to be the reason for its scarcity. There is currently in Australia no identifiable creative pedagogy to be transferred. While many aspects of pre-service education and teacher practice have elements of creativity, there exists no comprehensive, curriculum-wide, holistic, creative pedagogy.

7.4.2 Implications at the school level.

At the school level, reflective practice can be encouraged, modeled and sustained by practitioner enquiry. There is already an organisation to encourage this within and between schools called the Coalition of Knowledge Building Schools. Its convenor, Professor Groundwater-Smith, points out:

School based research is not the one off project, but is deeply embedded in each participant's consciousness (Groundwater-Smith 2003).

At the school level too, changes to Year 12 examination requirements, which drive so much of the senior curriculum, can be changed in such a way that pedagogy must be affected. For instance, in the early 1970s in Britain with the introduction of the Certificate of Senior Education (C.S.E.), oral presentations became a requirement in English. While orals are only one limited aspect of the role of language in learning, still, at that time many silent classrooms came alive with the sound of students talking.

In Australia, currently, there is a also a move to change curriculum but in a different way and one which is pertinent not only to changing aspects of pedagogy but also takes the requirements in a more creative direction. In an article on curriculum change, Professor Alan Reid says:

From this perspective, the starting point for curriculum planning is (a) an identification of the capabilities needed to live enriched lives and to participate actively in democratic life, and (b) a description of the underlying principles inherent in the capabilities. These principles will guide subsequent practice (Reid 2006, p. 5).

If capability is interpreted as a transformational requirement, then to demonstrate a capability, as opposed to giving right answers, writing essays or even showing key competences, would seem to imply a creative product. This could be a verbal, visual or physical demonstration and for this to happen the learning and teaching characteristics of a creative pedagogy would be needed.

7.4.3 Implications for pre-service and in-service education.

Pre-service and in-service education provides obvious opportunities. One in-service initiative that I was involved with took place in South Australia in the late 1970s and 80s. Garth Boomer as a Principal Education Officer (PEO) in the Education Department was able to get increased time for teachers' professional development. We met regularly for half days as well as consecutive days at Raywood.or Wattle Park, both in-service centres for educators. These groups of practising teachers discussed their

work in the light of educational theory, the most significant of which was the centrality of language in learning. They then wrote new curriculum, (Language across the Curriculum), syllabuses, (Drama Reception to 12), templates, and documentation of successful practice. More than this though they also spread the ideas through their credibility in their local areas where they taught, sometimes in after school workshops but also in school time.

Another is a pre-service model not yet tried in Australia but practised in England which relates theory, practice and school experience much more closely together. Experienced teachers were selected by the London University Institute of Education and through an agreement with the employing authority spent one day a week at the university in lectures and tutorials with pre-service teachers and the rest of the week in their own school. By this means a practising teacher was the students' tutor. This was much appreciated by the students who perceived the lack of recent school experience in their tutors as a disadvantage. The teacher was also being professionally invigorated with the opportunity once again to reflect on practice in the light of theory. This improved the teacher's practice and affected colleagues in their school. It also had the effect of spreading innovation and improvement from the grassroots across teaching practice in schools. If this were implemented it too could include creativity in learning and teaching.

The question of what is to be transferred remains. We must be very clear about the pedagogy and the quintessential teacher attributes that would need to be transferred. In Part 3 Chapter 8 a range of pedagogies are compared and a holistic creative pedagogical process is constructed and described built on the findings from this research.

PART 3 APPLICATION IN TEACHING AND LEARNING

CHAPTER 8

A CREATIVE PEDAGOGY

8.1 In context.

In the Introduction to this thesis, I said that I would state my theory, refer to relevant published research and then use evidence from my own practice and research both to critically evaluate the theory and, in conjunction with the theory, to develop and evaluate a methodology for implementing the theory.

That is to say that in the body of evidence from my practice and research there would be cases where I or other teachers would be successful or unsuccessful. One of the tests of the theory therefore was to explain both the successes and the failures and along with the practical experience to suggest ways to teach more effectively in the secondary classroom.

To this end I stated my hypothesis that a creative pedagogy would promote successful teaching and learning in the secondary classroom across the curriculum.

I then conducted a literature review in the areas of creativity, learning and language. From creators, creativity experts, neuroscientists and cognitive psychologists, I identified characteristics in relation to creativity and learning.

They were:

- Language
- Transformation
- Engagement
- Purpose
- Product
- Imaging

- Generation
- Analysis/synthesis
- Discussion/Connections/Criticism
- Narrative/story
- Making meaning/Symbol
- Emotion, involvement, empathy and humour
- Reflection
- Cooperation
- Confidence

The data I had collected from a variety of subject areas at secondary year levels and teachers and student cohorts across the curriculum were then examined in terms of these characteristics using a qualitative methodology.

The findings were that the characteristics were clearly and consistently present in the data, across the subject range, where success had been achieved. The degree to which they were present had an observed effect on the success of the learning. The lack of success, or failure, in learning occurred when some or all of them were absent.

The three characteristics of engagement, purpose and product stood out as being consistent and essential. The remaining characteristics of creative learning could seldom be collectively sustained without the presence of these three qualities. Most prominent of all was engagement, without which learning simply could not happen; connections were not made.

8.1.1 Possible pedagogies.

There are a number of learning models whose pedagogies incorporate elements of creative learning. They do not identify themselves specifically as creative pedagogies but include some elements of creative learning. These include, for example, those of Caine and Caine (1994) and Jensen (1998), already referred to in Chapter 2, and two Australian State curriculum initiatives, “SACSA” (South Australian Curriculum Standards and Accountability Framework) (2009) and Queensland’s “Productive Pedagogies” (2004). I have chosen these as examples in this category because they are

in widespread use and appear in pre-service educational courses. Their influence is significant.

There are also pedagogies designed to enhance aspects of creativity in learning, referred to in Chapter 2 at 2.1.2.3 (pp. 40-41). These set out more deliberately than the previous category to concentrate on creative aspects of learning.

Finally, there are some authors who promote creativity across the curriculum: Cropley (2001) and Runco (2007) for example. These are arguably best known in terms not only of creativity research but also of proposing a curriculum to implement it in learning.

A brief consideration of these three categories of pedagogical involvement with creativity may be fruitful in gauging whether any elements of creativity are missing and what characteristics would need to be added in a specifically creative pedagogy.

8.1.1.1 Creative pedagogies with some elements of creative learning.

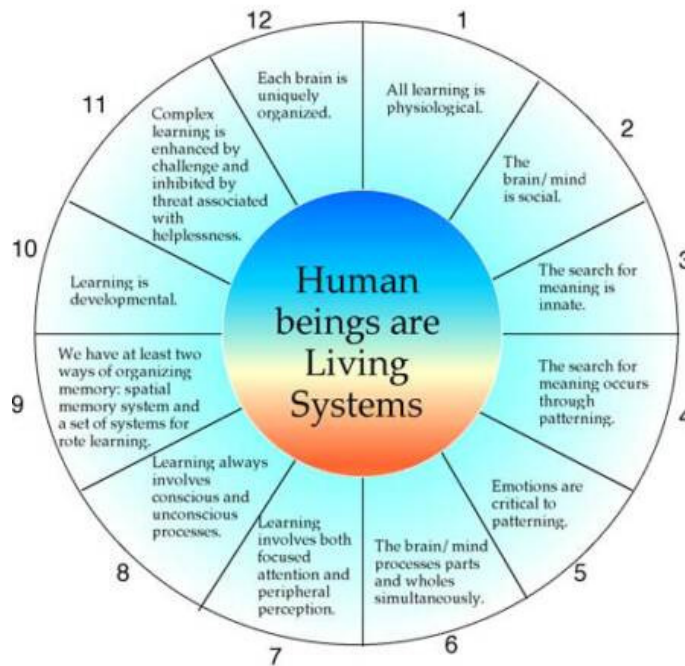
As has been previously noted, in Chapter 2 (p. 36) Caine and Caine (1994) and Jensen (1998) have each produced a list of “principles” for “brain-based” learning and suggestions for applying them in a teaching context.

Caine and Caine assemble the quintessential elements:

1. All learning engages the physiology
2. The brain/mind is social
3. The search for meaning is innate
4. The search for meaning occurs through patterning
5. Emotions are critical to patterning
6. The brain/mind processes parts and wholes simultaneously
7. Learning involves both focused attention and peripheral perception
8. Learning always involves conscious and unconscious processes
9. We have at least two ways of organizing memory: an autobiographical memory system and a set of systems for rote memory
10. Learning is developmental

11. Complex learning is enhanced by challenge and inhibited by threat associated with helplessness
12. Each brain is uniquely organized

They represent them graphically in a wheel:



While a graphic representation is often helpful; this is a static not a dynamic one. Most learning is related, connected and organic. The figure does not render this. The qualities in the wheel include emotion and meaning, so essential for creativity, but not symbol or language. Whether as lists or wheels Caine and Caine (1994) and Jensen (1998) provide frameworks for brain based learning rather than for creative learning. The lists and their examples of classroom practice, found in their associated works, do not provide a holistic viewpoint, a connected theoretical construct, which can be applied to myriad learning activities by the classroom teacher.

“SACSA” (2009) and “Productive Pedagogies” (2004) are both reform strategies in schools and are comprehensively put into practice by Governments. They provide overarching paradigms, connecting ideas and rich examples from educational practice.

Both have extensive websites and both have developed their theory and practice from educational practitioners and theorists working in schools, universities and government education departments. Such a process is an example of a community of teachers sharing their experience, reflective practice, theories and methodologies to improve learning, similar to the example of shared, replicable and commensurable professional learning described in Chapter 4 (p. 115).

They are constructivist in philosophy believing that we build new understanding based on prior knowledge and that learning activities are those of active engagement, inquiry, problem solving and collaboration with others. The teacher is not a dispenser of knowledge but a navigator and guide, facilitator and co-learner, who encourages learners to question, challenge, and formulate their own ideas, opinions, and conclusions. "Correct" answers and single interpretations are de-emphasised.

The “Essential Learnings” in “SACSA” (understandings, dispositions and capabilities) which are ascribed appropriately to different age groups and subjects also meld well with the creative characteristics and processes identified from the theory and practice of creativity.

<i>Futures</i>	<i>Identity</i>	<i>Interdependence</i>	<i>Thinking</i>	<i>Communication</i>
<i>Developing perspectives to critically reflect upon and contribute to creating preferred futures,</i>	<i>Critically understanding and developing personal identity, group identity, and relationships, and acting to shape these,</i>	<i>Developing a sense of connectedness with other people, and systems, reflecting on and taking action to shape local and global communities</i>	<i>Developing creativity, enterprise, wisdom and the capability to evaluate and generate ideas and solutions,</i>	<i>Developing knowledge, skills and dispositions required to construct and deconstruct meaning and to critically understand and use the power of communication and technologies</i>

These qualities of ‘thinking’ are further defined for students in their senior years as including enterprise, wisdom and the capability to evaluate and generate ideas and solutions, including:

- developing metacognitive awareness, and appreciating multiple ways of thinking, knowing and relating from a range of times and cultures
- using multiple ways of thinking to discover, construct and deconstruct meaning
- actively processing complex and competing sets of information

- extending the complexity of connections among ideas in technological, social, economic, political and cultural environments
- generating new personal understandings and knowledge, recognising opportunities and experimenting creatively to achieve innovative solutions.(SACSA 2009).

This includes making connections, metacognition, generation and creation. It also contains the brain manipulation of complementary opposites as part of higher order thinking. Here it is constructing and deconstructing; in creativity it is divergent and convergent, analysis and synthesis.

There are two further components which are particularly relevant to this discussion of creative pedagogy, first the importance of language; second the provision of a pedagogical template for teachers.

“Productive Pedagogies” includes references to both. On language it is concerned with features of substantive conversation in the classroom as an important part of learning:

In classes with substantive conversation there is considerable interaction among students, and between teacher and students, about the ideas of a substantive topic; the interactions are reciprocal, and promote shared understanding.

In classes where there is little or no substantive conversation, teacher-student interaction typically consists of a lecture with recitation, where the teacher deviates very little from delivering information and asking routine questions. In this situation students typically give very short answers. Discussion here may follow the typical IRE pattern: low-level recall/fact-based questions, short-utterance or single-word responses, and further simple questions and/or teacher evaluation statements such as 'Yes, good'. This is an extremely routine, teacher-centred pattern, amounting only to a 'fill in the blank', or 'guess what's in the teacher's head' format (Productive Pedagogies 2004 Section Intellectual Quality, sub section Substantive conversation).

This reflects and relates to much of what was discussed on the role of language and discussion in Chapter 3, as well as the frequency of such language in the lesson data.

On pedagogy it states:

Productive Pedagogies are classroom strategies that teachers can use to focus instruction and improve student outcomes. When planning learning experiences,

teachers can review the pedagogies to see which are best suited to teaching the particular knowledges and skills involved (Productive Pedagogies 2004, Section New basics project, subsection: About productive pedagogies para.1).

A clear process is outlined for teachers to implement pedagogy. It consists of four versions of looking at what it calls “repertoires” and “referents” from different perspectives. Here is one example:

Plan version 2

Looks at repertoires and New Basics referents through the eyes of each Rich Task and asks you to:

- identify which repertoires will be the focus in the years preceding the junctures 3,6,9 but does so with a focus on the New Basics referent
- identify school programs/activities/repertoires that will enhance a New Basics referent within the enactment of the Rich Task (New Basics 2001, p.3).

In relation to the characteristic of intention to learn or engagement necessary in a creative pedagogy, “Productive Pedagogies” says:

Academic engagement is identified by on-task behaviours that signal a serious psychological investment in class work; these include attentiveness, doing the assigned work, and showing enthusiasm for this work by taking initiative to raise questions, contribute to group activities and help peers (Productive Pedagogies 2004, Section Supportive classroom environment, subsection academic engagement).

Research on the nature and operation of engagement spans the last twenty years. Early studies often measured the time spent on the task, time-based indices, to assess the rate of student engagement (Fisher et al. 1980; Brophy 1983). Later research focused on student willingness to participate in a range of school and class routines and directions (Natriello 1984). However, engagement closer to the kind noted in this thesis in relation to creative learning, referred to by Dudek and Coté (1994, p. 34) and Runco (2001, p. 13), did not appear until 1993 when Skinner and Belmont added emotion to the definition. They called this ‘...the intensity and emotional quality of children’s involvement in initiating and carrying out learning activities’. They also point out that engagement sees students selecting tasks ‘at the border of their competencies’. It is

noteworthy that they believe engagement leads to such risk taking and “proximal zone” learning, discussed in Chapters 2 and 3 in relation to learning and creativity. They further contrasted these characteristics with ‘disaffection’ where students do not display positive emotions such as enthusiasm, optimism, curiosity and interest, (Skinner & Belmont 1993, p. 572).

The example above from “Productive Pedagogies” includes to some degree examples of the three criteria indicated in the research on engagement: cognitive, behavioural, and affective. They are expending mental effort in the learning tasks required, they are responding actively and their attitudes are positive. However, they do not appear to have been creatively involved in setting up the tasks and there is no mention of the purpose or the product of the activity.

The missing link still seems to be how to make the talk, the pedagogy and the engagement happen in the classroom. They do not say how this is achieved. It seems to be frequently assumed in writing about pedagogy that what happens in the classroom derives from the predetermined outcomes or qualities favoured by the authors. You do not need pedagogy just “good” outcomes.

The last description above is an example of this. There is a definition of “academic engagement” followed by how it manifests itself in a classroom but no explanation of what drives, galvanises or promotes such absorbed learning. It certainly does not happen through instruction or osmosis. Indeed the fact that the engagement is entitled “academic” rather than “intellectual” and the activity is “on-task” would suggest that the activity is even more narrowly defined by the “assigned work” set by the teacher.

As the eminent researcher of organisational learning Chris Argyris would say, any proposed strategy has to be actionable, otherwise it is meaningless. He states, ‘Moreover, many of the programs were not implementable, and their creators appeared skillfully unaware of the inconsistencies’ (Argyris 2000, p. 14).

8.1.1.2 Pedagogies enhancing creative learning

Learning theories and pedagogies not ostensibly “creative” still in many ways may promote and support many characteristics of creative learning. They do not, however, emphasise creativity or make full use of its ability to galvanise learning.

Creativity experts writing about pedagogy, with a view to enhancing creative learning, provide, as we have seen, lists of qualities and a variety of methods to test whether creativity has occurred or enhanced learning.

Runco’s contribution to this discussion about creative pedagogy is twofold. He introduces the notion of teacher direction in creative learning and leads us to an aspect of Piaget which is particularly relevant.

On direction, he counterposes “instructions” to “directions” arguing that “explicit” instructions may provide “an advanced organiser” for the students providing them with a “structure” for the knowledge “up front”. They will not then, he says, waste time on resources which are not essential. This goes against the often repeated characteristics of immersion in a domain (all of it needing to be experienced, useful or not; selecting from it; analysing and synthesising; important creative traits) and the notion of improvisation or play so commonly found in the “preparation” period. Runco suggests that the instructions could include: ‘give only original ideas’; ‘give only ideas nobody else would think of’ (Runco 2007, p. 200). This seems less like guidance or navigation on the part of the teacher and more like creativity in a straight jacket.

The aspect of Piaget that Runco draws us to is the phrase and title of Piaget’s monograph, “To Understand is to Invent: The Future of Education” (Piaget 1973, p. 1). While Runco takes this to indicate Piaget’s preference for “instructions” allowing students to think about and use the information, my reading of the monograph is a more constructivist one in that Piaget says, ‘Programmed instruction is indeed conducive to learning, but by no means to inventing, unless ... the child is made to do the programming himself’ (Piaget 1973, p. 7). And further:

To understand is to discover, or reconstruct by rediscovery, and such conditions must be complied with if in the future individuals are to be formed who are capable of production and creativity and not simply repetition (Piaget 1973, p. 20).

That is, only inventing, discovering for oneself, having a new idea and making it into a product can give real understanding through the process of thinking, analysing and synthesising, computing, trying out, failing, succeeding, producing and reflecting.

Cropley (2001, p. 147), however, provides a componential model of creativity citing Urban (1990). It is based on six components each with a set of sub components that work together for, and in, the creative process within a framework of environmental conditions. They are:

1. general knowledge and a thinking base
2. a specific knowledge base and area specific skills
3. divergent thinking and acting
4. focus and task commitment
5. motivation and motives
6. openness and tolerance of ambiguity.

The holistic and interactive characteristics are certainly demonstrable in creative activity as are the pages of dot points explicating each of these headings which follow in his book. However, they would seem to be impracticable as a framework for teachers to plan or evaluate their own classroom practices on a daily basis. Furthermore, the examples given of creativity in a classroom are either snippets or extremely complex tasks and they are all teacher driven, for example:

- Contents could be drawn from outside school, for instance during camping trips, out-of-school projects, hobby activities or even shopping.
- In mathematics students could be asked to indicate the consequences for geometry, engineering or real life if it were found that the sum of the angles of a triangle is not 180 but 200 degrees.
- In modern languages (German, French or Russian) they could be given the assignment of explaining what problems of expressing meaning would rise if reflexive verbs suddenly cease to exist in the language (Cropley 2001, pp. 152-53).

Cropley's overall views are similar to my own but his examples of creativity in practice and his componential model and pedagogy differ from mine. The examples do not seem to reflect the socially and emotionally driven creativity of students and teacher working together for a purpose. The model is not holistic or clear enough to apply to the variety of creative work which can emanate from productive students.

8.1.2 A holistic model.

In attempting to make worthwhile additions to learning frameworks and pedagogies from a creative perspective, my model will be centrally, not serendipitously, creative. It will be constructed from the characteristics of creativity found in the research, holistic, dynamic and with pedagogy useable by teachers.

In this research, from both the literature and the reduced data, it appears that central to creative learning is a methodology driven and maintained by **engagement**, (Jensen 2004; Caine & Caine 1994; Damasio 2006) in Chapter 2 (p. 36; p.61) and (Anderson 1986; Godin & Shephard 1986) in Chapter 6 (p. 196), and **purpose and product** (Nickerson 1999; Freeman 1983) in Chapter 1 (pp. 18-19); (Harris 2006) in Chapter 2 (pp.71-72) and (Freire 1972) in Chapter 3 (p.92). High scores on engagement, purpose and product are also present in the Tables 2 and 3: Lesson data analysis (learning and creativity characteristics) in Chapter 6 (pp. 218-220).

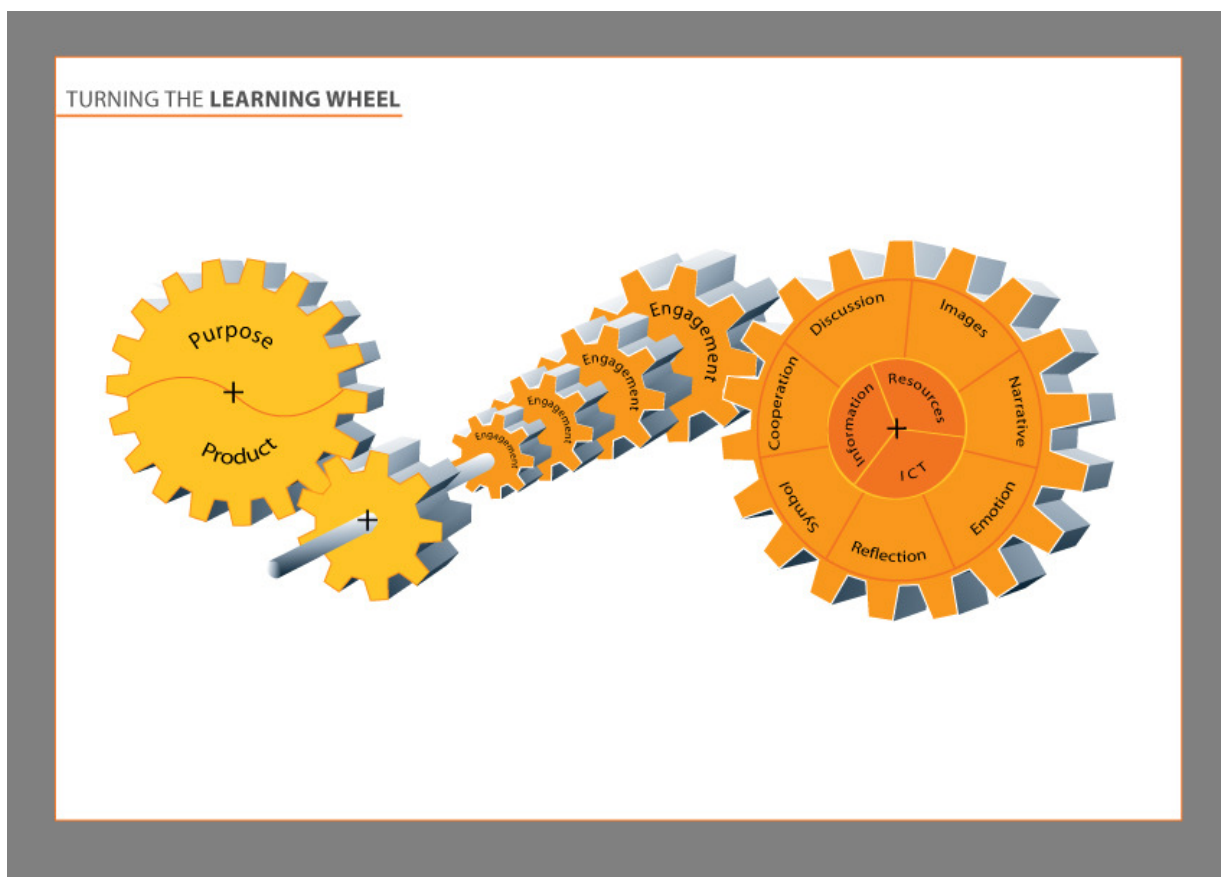
There are many metaphors which can describe this creative learning in a holistic and dynamic way. They include creating a garden, building a house, making a machine. Each shares the qualities of preparation, planning, gathering information and trying out, immersion in the domain, cooperation, reflection, incubation and of course making a product. The various parts of this process are referred to in Chapters 1 to 3, particularly, on preparation, Wallas (1926) in Chapter 1 (p. 11); Runco (2007); Nickerson, on domain immersion (1999) in Chapter 1 (p. 17) and Andreasen (2006); Murphy, on cooperation, (2005) (p. 74).

However, as the representation for my holistic, dynamic model, I have chosen a learning wheel driven by purpose and product and mediated by the degree of engagement. In the

diagrammatic form of the “Turning the learning wheel” engagement, purpose and product are driving and interconnecting the transformative process of learning. The graphic representation aims to help in both understanding and applying a creative pedagogy.

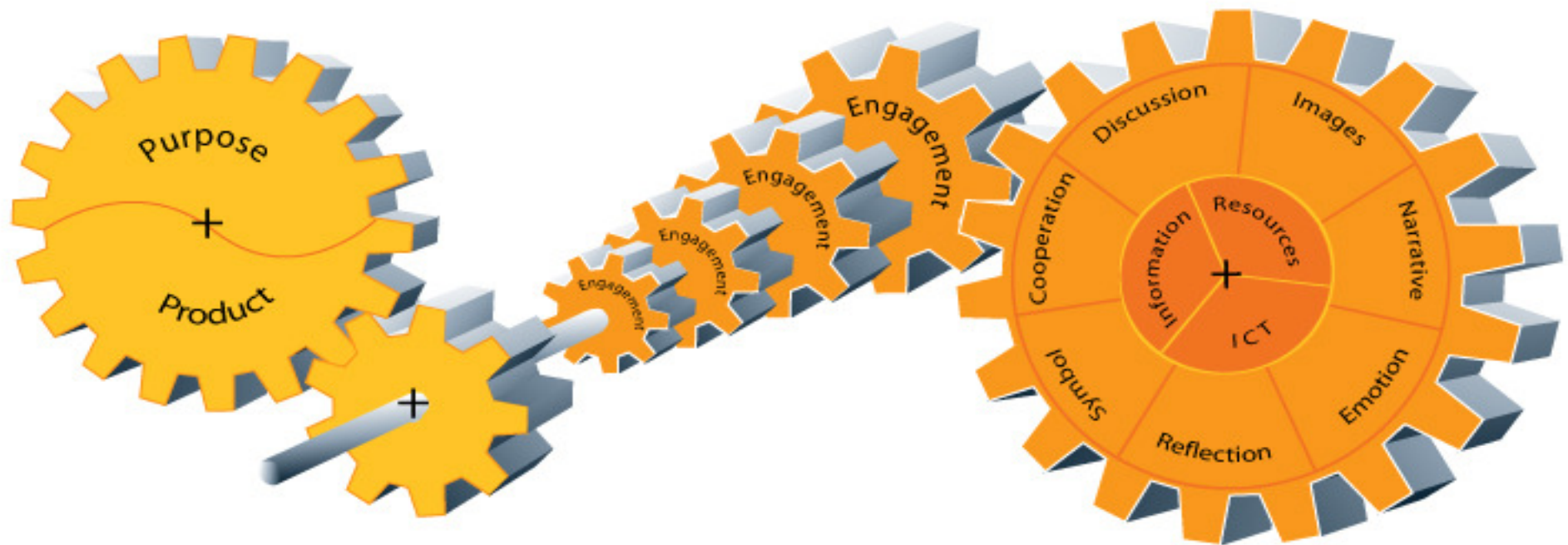
Both the graphic representation and the accompanying template rubric are drawn up as an aid to applying a creative teaching pedagogy. The graphic seeks to help show the whole dynamic process as a holistic model. The template may be used as a guide beforehand or a reflective framework afterwards irrespective of the length of the learning period.

8.1.2.1 Turning the learning wheel (see full size on next page)



The big wheel on the right contains the elements of what is happening in a creative educational process.

TURNING THE LEARNING WHEEL



It includes:

Discussion (language, problem posing and problem solving, connecting and criticism)

The generation of images (imaging, using the imagination,

Narrative (stories of all kinds giving meaning to the activity and helping to form concepts)

Emotional involvement (excitement, empathy; relationships; confidence, pride, humour)

Reflection time (throughout and at the end)

Symbol (meaning, patterning, where something stands for something else, writing, number, enactment)

Cooperation (supporting, sharing, collaborating)

Resources (costume, copper wire or other people)

ICT (media, research, presentation)

Information sources (extending students' knowledge from where they are now.)

All of these elements derive from consideration of research literature on creativity, Chapter 1, creativity and learning, Chapter 2 and creativity and language, Chapter 3. They are summarised at the end of the respective chapters. They are also present in the data reduced and presented in Chapter 6 (pp. 218-220).

The wheel on the left is where the process is started with a purpose, and the product that concretely shapes the purpose. The purpose and product wheel drives the engagement shaft.

The smallest wheel of engagement on the shaft turns the big wheel rather slowly. The larger engagement wheels representing increasing levels of engagement drive the learning wheel progressively faster, that is, the greater the engagement the more movement there is in the learning wheel.

This important role of engagement, attention and motivation is supported in the research (Amabile 1983, 1990; DeCharms 1968; Deci 1975, 1980; Golann 1962; Hennessey & Amabile 1988;) in Chapter 5 (p. 169).

The larger engagement driving the wheels faster parallels the conviction of neuroscientists and cognitive psychologists that increases in the number of connections,

and the formations of schema or complexes, relate directly to greater knowledge and more complex, higher order thinking, in Chapter 2 (pp. 62-64) (Greenfield 2001; Torey 1999; Damasio 2006; Bloom 1956).

Lastly, greater movement in the learning wheel and increased connectedness, richness and complexity of the learning is also reflected in Chapter 6 in Table 4: Lesson data analysis (learning and creativity characteristics totals) (p. 219) and Figure 1: Lesson data analysis (learning/creativity correlation plot) (p. 219) which indicate generally that as the creativity characteristics identifiable in a lesson increase so do the amount and variety of learning characteristics.

It must not be forgotten, however, that it is the teacher and students together who create the engagement, the purpose and the product.

The teacher helps to build confidence, appropriate relationships and opportunity, as well as providing suitable environments and a variety of cognitive, social and emotional processes needed for the creative product. The questionnaire responses on ‘Teacher Attributes’ showed clearly the importance attached by students and adults alike to these characteristics in Table 5: Questionnaire responses and Figure 2: Questionnaire response analysis – Attribute frequency. Similar teacher attributes were also considered of significance in the research findings in Chapter 5 (p. 161) (Barnes 1976) and a lengthy discussion of the creative teacher’s role and attributes in Chapter 2 (pp. 72-73) (NACCCE 1999) and (p. 37) (Caine & Caine 1994).

8.1.2.2 Elements of the model in more detail

Engagement is integrally connected to purpose and product. They are inseparable and ongoing throughout the task. They have a dialectical relationship; they affect each other.

The purpose needs to be a creative one. For instance, a purpose which sought to complete a work sheet, test or examination set by the teacher is not sufficient. Such tasks require very few of the characteristics of a creative pedagogy. What is produced needs to be authentic and preferably chosen and planned in negotiation with the teacher, not teacher contrived, as Dudek and Coté (1994) and Kohn (1993) observed in their

creativity research, in Chapter 2 (p. 40). The product is itself a transformation of ideas and information and also creates a transformative process.

The remaining creative characteristics are part of this process. The process includes intention, trying out and gathering information, product and reflection. On the way, there is discussion using various kinds of language at each stage, cooperation, generation of ideas, narrative, imaging, meaning making and the emotions of empathy and humour. The final product, and reflection on it, is not so much an end as a new beginning. What is learned can be drawn upon in the next task, in other areas of learning or in real life situations.

The teacher attributes need to match the process; energising, building confidence, making bridges from the known to the unknown, scaffolding, navigating, being critical, supporting as a friend would, treating the creators with respect and sharing in the satisfaction. As noted above, many of these attributes were identified through the questionnaires. Many of the attributes depend upon talk of various kinds and it was noteworthy that the students valued most highly the opportunity to talk, in Chapter 7, section 7.4, (pp. 235-236) Figure 2: Questionnaire response analysis – Attribute frequency. These teacher attributes also rely on successful relationships between students, and students and teacher, and it was this attribute that was most highly prized in the adult questionnaires to be seen in the same Figure. Other attributes supported in the questionnaires which fit well with the process are the emotional elements of excitement, fun and passion, and opportunities to discuss and be critical in a variety of ways and situations.

The place is also a significant component of creative teaching and learning as discussed in Chapter 2 (p. 73). It needs to be enclosed enough for concentrating without disturbance, safe and secure and an appropriate physical environment. As Parsons et al. (2001) have pointed out the physical environment influences both relationships in learning and the learning itself, ‘the academic and social interactions that occur in classrooms’ (Brady & Scully 2005, p. 108). Wherever possible, learning areas should contain items of creation by the students themselves or others. Examples would be photographs of previous performances, art work, model aeroplanes or posters. This contributes to immersion in the domain (Runco 2007; Nickerson 1999; Watts 2009;

Robinson 2009), discussed in Chapter 1 (p. 17) in a creative way and can also be part of the purpose for the products.

The school community, for its part, can both receive products and share in making them, whether a play production, a film, a concert, a magazine, a poster, a display, an exhibition or even a wind tunnel.

The local school management is a major influence in terms of supporting or hindering a creative pedagogy. We have seen three instances in the data, Chapter 5 (pp. 146-150) where poor school behaviour management, inadequate literacy programmes and sparse special needs support have adversely affected classroom methodology and student outcomes. The positive part which local school policy can play is in the provision of additional resources, extra teacher preparation and reflection time, vertical or flexible student grouping and support for an integrated or creative curriculum.

To implement a creative pedagogy, all the items above need to combine. There will be a difference of degree to which they do so depending on the learning activity.

8.1.3 The template.

The template is derived from the characteristics of learning and creativity and combined.

The subject or unit which you have to teach may be your own choice or a required part of the curriculum. In either case you have a choice of approach.

Your choice will obviously be on the basis of what you consider best matches the learning needs and the intellectual and social growth of the students. It will need substance and challenge. Triviality promotes a trivial response; choosing an area of knowledge of interest which is where the students are already comfortable may act well as a starting point but needs to extend and expand from that point; creating the product needs to contain some struggle in order to learn and make new connections but has to be achievable at a number of levels and in a number of ways described by Vygotsky (1978

p. 88) as being within their ‘proximal zone of development’, discussed in Chapter 5 (p. 131).

The template as a guide beforehand.

TABLE 6 CREATIVE PEDAGOGY TEMPLATE.

SUBJECT	
PURPOSE AND PRODUCT	
DISCUSSION	
IMAGES	
INFORMATION	
NARRATIVE	
SYMBOL	
EMOTIONAL	
REFLECTION TIME	
RESOURCES	
INFORMATION TECHNOLOGY	
COMMUNITY	
OVERALL PATTERN	
NEGOTIATE	
COLLABORATE	
PACE, SPACE, VARIETY	
CULMINATION	
FINAL REFLECTION	

1) Planning

Consider the learning activity from the point of view of purpose and product.

How can the subject matter, activity or area of knowledge be purposeful and productive?

Will it enable you to promote discussion in large and small groups? Will it be discussion which will enable students to grow new knowledge and learning from what they already know? Will it be discussion which will advance concrete examples as the basis of new concepts? Will it be discussion of various kinds using a variety of language registers?

Will you allow for the opportunity to explicitly call up images? Will you actively promote use of the imagination?

Calling up an image is a way of selecting and focusing on one element of an issue or experience in order to further explore the image itself and the issue or experience it is related to. Calling up images is the fabric of the creation of poetry, narrative and drama. Imagining, on the other hand, involves creating anew a scenario or series of events and seeing them internally often in sequence. This too is an important part of artistic and scientific creation and exploration.

Will you encourage a wide and varied gathering of information and knowledge for use, from people, print, visual media and internet?

Will you include, provide and value the opportunity to share student narrative and experience? Telling stories will frequently provide the foundation for generalised understanding to form or concept formation. The stories will provide the clothes for the coat hanger of meaning.

Will the activity involve using symbol, where something stands for something else, for presenting, writing or numbering?

Will there be opportunities for emotional involvement, empathy, humour, excitement?

Will you include critical reflection at the end of phases and at the end of the activity?

Do you have adequate resources for the activity? Will you organise the space and furniture appropriately in negotiation with the students? Is the environment as stimulating as you can make it?

Can you include elements of information technology?

Is school community audience or involvement a possibility?

Do you have an overall pattern of (a) intention (b) gathering information and trying out (c) producing something to share with others (d) reflection? (Boomer 1992).

2) Your role

Discuss your choice of activity with the students, explaining the reason for it, its purpose, and the consequences. Make the pedagogy explicit and negotiate relevant alternatives and ways of proceeding.

As you proceed, act as a navigator, collaborator in the task, support the activities, show respect to students and their ideas, be a teacher-learner and learner-teacher, build confidence through praise and appropriate challenge.

Be aware of and sensitive to the class activity in terms of pace, space and variety.

Set up a culmination of the creative activity, however large or small, to have the best chance of success.

Allow plenty of time for class, small group and individual reflection in terms of what was learned, what worked best and what can be better done next time.

8.1.3.1 The template for reflection.

These two examples, taken from observed practice, demonstrate using the template afterwards for reflection:

TABLE 7 CREATIVE PEDAGOGY TEMPLATE FOR REFLECTION ON A PHYSICS LESSON

SUBJECT	Content required by the course but own choice of “FLIGHT” theme. Units included model aeroplanes, kites, radio controlled aircraft and gliding. (Kite unit reflected on here.)
PURPOSE AND PRODUCT	Immersion in science and technology and operating on it. Transformation between theoretical and practical. Impinge on adult world. Build and fly complex box kites at the International Kite Festival.
DISCUSSION	Large and small groups; built on what already knew; new concepts of major importance.
IMAGES	A continuing activity as visualised forms and angles of flight and freedoms.
INFORMATION	Sought explicitly but with options, historical particularly important.
NARRATIVE	Student experiences and weekly presentation of historical figure in progress of flight.
SYMBOL	Creation required calculation and estimation.
EMOTIONAL	Continual excitement and final celebration with pride that international visitors wanted to see their kites
REFLECTION TIME	During the step by step process and at the end in full.
RESOURCES	Students paid for own materials. Some of the finished kites will contribute to a stimulating classroom/lab. Environment in future.
INFORMATION TECH.	Some of the research via internet mostly from books.
COMMUNITY	All Yrs. 5, 6 and 8 students made simple kites and took them to the Festival with Yr.11 sophisticated kites. Parents accompanied. All kites displayed in flight for school community.
OVERALL PATTERN	Intention, information, improvisation, products and reflection.
NEGOTIATE	Ongoing.
COLLABORATE	Genuine collaboration and confidence building, first time for teacher too.
PACE, SPACE, VARIETY	Varied.
CULMINATION	Success at Festival, school display and attention from international visitors.
FINAL REFLECTION	What had been learned was reflected on and further refined in next gliding activity.

The lessons in the first example were part of YEAR 11 PHYSICS: AERODYNAMICS AND AERONAUTICS encompassing Newton's laws of motion, degrees of freedom, stability and theory of moments.

This series of lessons successfully includes, to varying degrees, the characteristics of a creative pedagogy implemented as a methodology. The methodology, in template form, is used before hand to plan and afterwards by the teacher to reflect and learn. Unlike the "bonding of atoms" series of lessons described in detail in the data section of this thesis, part of this physics activity, the gliding unit, did lead to an improvement in the conventional test results by these students compared to the cohort of the previous year who had not learned that element of the course in a creative way. The teacher pointed to the change in attitude to account for the greater keenness to learn and succeed.

I have observed many lessons which have either none of the characteristics of the methodology or too few to be successful. Some have partial success where the addition or expansion of some of the elements could have transformed the outcome.

For instance, I recently saw a creative approach to history and writing as part of S.O.S.E (Study of Society and Environment) where an elderly person, who once attended the school, was invited to talk to current students. The students discussed suitable questions beforehand and practiced asking them in a cooperative way. They were stimulated at the prospect of the forthcoming interview.

After the interview was successfully completed, students and teacher reflected on what they had learned about the past and their school in particular. They said what they had learned or could remember one at a time. The teacher typed these remarks on to the smart board. The students were then asked to write about what they had learned.

They were not engaged; they copied the sentences from the board with some slight variations. What was clearly missing was the suggestion of a variety of genres they might choose (story of the school in the past or the visitor at the school in the past on one particular day or themselves in that position); a prompt to start (such as 'I remember when ...') or, most importantly, any chance to call up images and find words to describe them. There was certainly no attempt to see any of the experience as symbolic.

TABLE 8 CREATIVE PEDAGOGY TEMPLATE FOR REFLECTION ON A SOSE LESSON

SUBJECT	SOSE
PURPOSE AND PRODUCT	Understanding of the past in terms of a local person and the school. A piece of writing about the experience NOT NEGOTIATED WITH THE STUDENTS; NOT TRANSFORMATIVE.
DISCUSSION	Before the interview, at the interview and afterwards.
IMAGES	Offered by guest NOT CALLED UP BY STUDENTS.
INFORMATION	Information was provided by the guest and teacher. NOT SOUGHT BY STUDENTS FROM ANY OTHER SOURCE.
NARRATIVE	By the guest NOT BY STUDENTS.
SYMBOL	X
EMOTIONAL	For the interview NOT AS A RESULT OF IMAGINING AFTERWARDS IN WRITING.
REFLECTION TIME	SOME
RESOURCES	All were available including 'smart board'.
INFORMATION TECHNOLOGY	Available NOT USED FOR RESEARCH.
COMMUNITY	In person invited and information provided.
OVERALL PATTERN	Intention, gathering LIMITED, PRODUCT MINIMAL.
NEGOTIATE	Visit was negotiated with students; PRODUCT WAS NOT.
COLLABORATE	This occurred preparing for the interview.
PACE, SPACE, VARIETY	This occurred at teacher direction.
CULMINATION	Product achieved BUT LESS THAN WAS POSSIBLE, LITTLE TRANSFORMATION.
FINAL REFLECTION	Two readings by students only NOT FOLLOWED UP BY REFLECTION.

There was no chance to build on the knowledge, from grandparents for instance, that students already had of the past, people and schools.

One student read out his own work; another offered but was denied. The writing was placed into files. There was no attempt to make it into a post card or diary page to send to the guest or any discussion of any purpose for the writing other than as a class task.

The template shows where productive changes could be made next time in any similar situation. It also shows up, interestingly, that the omissions are often lack of student involvement in researching, talking, planning and deciding which are so important in thinking and learning. These are the mental operations described by neuroscientists as the “executive function” made possible by the frontal cortex and which are essential for maturity. They are also the areas which most require language use to acquire ever more thinking, talking, reading and writing complexity.

8.2 Some reflections on the pedagogy.

The omissions above underline the importance placed by Douglas Barnes on “school knowledge” rather than “action knowledge”:

‘School knowledge’ is the knowledge which someone else presents to us. We partly grasp it, enough to answer the teacher's questions, to do exercises, or to answer examination questions, but it remains someone else's knowledge, not ours. If we never use this knowledge we probably forget it. In so far as we use knowledge for our own purposes however we begin to incorporate it into our view of the world, and to use parts of it to cope with the exigencies of living. Once the knowledge becomes incorporated into that view of the world on which our actions are based I would say that it has become 'action knowledge'. (Barnes 1976, p. 82).

What we can expect, as children use language to make knowledge their own, is a two-way process: they will be both putting old familiar experience into words in order to see new patterns in it and trying to make sense of new experience by finding a way of relating it to the old. (Barnes 1976, p. 84).

In this latter lesson, and many others I have observed, imagination, empathy and emotional involvement are also missed. The importance of including these in the learning domain was recently highlighted by author Ian McEwan, in an interview on ABC TV:

KERRY O'BRIEN: You read yesterday from an essay you wrote immediately after September 11 in which you argued if the terrorists had been able to put themselves in the minds of their victims they would never have done it. You wrote, "Imagining what it is like to be someone other than yourself is at the core of our humanity, it is the essence of compassion and it is the beginning of morality", so why don't we reach for the core of our humanity more often?

IAN MCEWAN: Sometimes it's necessary to be suspicious, so we've refined this to such an extent it carries over into novel writing, as we've seen right now. There's hope for us. We have this innate ability to empathise. It's something we do so automatically, something no computer could do for us. Now we are faced with the problem perhaps of trying to empathise with people we've never met, future generations. How are they going to feel if we let the land, the planet go to waste? (McEwan 2008).

Both methodological templates include use of digital technology. Many of the lessons in the data section (Part 2 Chapter 5) include operating on and with the new technology in popular media. The importance of incorporating this vast, new and influential medium into education in a creative and critical way is frequently researched and discussed (Kellner 2000, pp. 197-221).

The challenge to education and educators is to devise strategies to teach media and literacy while using media materials to contribute to the advance of multicultural education (Kellner 2000, p. 202).

And, quoting Henry Jenkins, he says:

... a new kind of radical media education based on the assumption that children are active participants within popular culture rather than passive victims. We need to help our children become more critically reflective about the media they use and the popular culture they embrace, yet we can only achieve this by recognizing and respecting their

existing investments, skills and knowledge as media users. In the end our goals must be not to protect our children but to empower them (Jenkins 1997, p. 31).

A last reflection on the methodology is a topical one. During the last ten years there has been considerable interest in the notion of “wellbeing” in education. It has grown to international prominence as a component in education and teacher education. A programme for implementation developed in 2007 by DECS (Department of Education and Children’s Services) in South Australia has just been launched. Geelong Grammar School in Victoria has incorporated a programme of well being and confidence across the school and its community. Additionally, an international conference (one of several) was recently held in Budapest.

The qualities of wellbeing include the cognitive, emotional, physical and social. They are found in creative learning. The main difference seems to be that in a creative pedagogy they are gained through achievement in learning whereas in a wellbeing programme they are the subject of learning themselves. However, the pedagogy referred to in the DECS publication certainly shares some similarities with this creative methodology: engagement, empathy, language, story, imaging and emotions. It is dedicated particularly to the education of “children /students with learning difficulties” (DECS Foreword 2007). Although it describes such learning as “core business” (DECS 2007, p. 4), unlike the creative methodology advocated in this thesis, it is not about all the students and their learning in mainstream curriculum and classes.

Chapter 9 will review the conclusions drawn from the data in relation to what was being hypothesised and tested and consider the possibility of creative pedagogy being supported in the secondary classroom.

PART 3

CHAPTER 9

CONCLUSION

9.1 Hypothesis, evaluation and future directions

9.1.1 Hypothesis.

This thesis is about the role of creative pedagogy in teaching and learning.

My original question was whether or not creative teaching enhanced learning. I stated as my hypothesis that a creative pedagogy would promote successful teaching across the curriculum in secondary schools. Using a variety of data from my experience as a reflective practitioner I then set about testing the theory.

In conjunction with the theory and data analysis I developed a creative pedagogy which can be used to teach more effectively in the secondary classroom.

Part 1 took me on a research journey through creativity, learning and language. I identified their main characteristics and the ways in which they were connected or complementary. In Part 2, I examined the data I had collected, from lessons, observations and questionnaires in a variety of subject areas, secondary year levels, teachers and student cohorts across the curriculum, in terms of these characteristics. In Part 3, I examined other pedagogies in relation to creativity and constructed a holistic model and template for use by teachers. The last chapter evaluated the work in relation to the original hypothesis and considered some future directions and research.

The qualitative research methodology I chose to manage the data and accomplish the testing of my hypothesis was that of description, analysis, reduction and display (Miles & Huberman, 1994).

On the basis of the findings I constructed a creative pedagogy for use in the secondary classroom in the form of a holistic model and a rubric as template.

9.1.2 Evaluation.

In this concluding chapter it is appropriate to try to evaluate the process and the findings in relation to the hypothesis.

Certainly the lesson and transcripts description and analysis exposed varying degrees of success in terms of characteristics of creativity and learning across the curriculum. The observations, surveys and questionnaires revealed some recurring themes which were consistent with this. But, perhaps most importantly, there were two findings that were continually, clearly and strongly represented.

The first of these was the consistent presence of engagement, purpose and product in lessons where successful learning had taken place. Furthermore, a high degree of engagement, derived from the purpose and product, led to a higher number of learning characteristics occurring.

The second was the correlation between creativity and learning characteristics shown in the tabulation and the indications from the scatter plot graph that ‘as the creativity characteristics identifiable in a lesson increase, so does the variety of learning characteristics’.

As we have seen, creativity in education is most often cast as learning to create, usually in the arts, or including creative elements as part of a learning programme. The finding above casts a new light on such practices. It seems rather that creativity itself is a learning process in whatever field it is practised. The act of transformation in making something new or original for a purpose cannot help but engage the brain, fire the neurons and make the new connections, as the neuroscientists have told us. As has been acknowledged, this is not to rule out some single-loop or incremental learning as part of the creative endeavour but it is in the service of the creation not as an end in itself.

9.1.3 Future directions.

Based on this research, the implementation of a creative pedagogy could be valuable across the secondary curriculum. Given my findings, although necessarily limited in scope, and the findings of the Department of Education Employment and Training (DEET)'s "Science in Schools Research Project", attached in the Appendix (6), teaching and learning in the sciences might particularly benefit.

From my past and current experience as a teacher and teacher educator, I believe that a number of teachers and student teachers want and need a holistic model in their everyday preparation, teaching and reflection. They do not find unrelated aspects of learning theory or behaviour management often presented to them sufficient or satisfactory.

At a recent Middle Schooling Conference called "Taking Control of Methodology in Testing Times" (Australian Education Union 2008), I presented a "keynote presentation" on creativity and learning and conducted a workshop using a prototype of "Turning the Learning Wheel" and its accompanying pedagogy. Year 8 and 9 teachers enjoyed looking at a recent lesson or set of lessons of their own using this model and became excited as they planned learning for the future using the template. The reported feedback was that it would be good to build on this at the conference in the following year.

However, for widespread and long term application of the creative pedagogy a great deal more than an occasional workshop or conference will be needed. Considerations will include transferability of teaching attributes, pre-service and in-service education, systemic acceptance and implementation, and ongoing research.

9.1.3.1 Transferability of teaching attributes.

It was noteworthy that only one adult from the group of students and adults answering the questionnaires believed that the attributes of the creative teacher they knew could ever be transferred.

Students of education and qualified teachers clearly do learn the practice of teaching and change their methodologies for a variety of reasons. Teacher attributes are learned.

One test of transferability would be to see whether teachers are willing to try out alternative methodologies and whether they succeed. Such methodologies could also be trialled in small ways in teacher education programs. I have already begun such trials, on a small scale, through involvement in pre-service teacher courses.

Examples of one pre-service and one currently employed registered teacher using a creative pedagogy, the appropriate teacher attributes and the template associated with “Turning the Learning Wheel” are included in Chapter 8.

Frequently, pre service teachers cite their own teachers as their models, while others, of whom I am one, emerge from their studies of education with a clear methodology based on theory, practice and reflection.

Reflection may consist of writing up, recordings, talking things through with a supervisor and so on. In the act of reflection we spend time exploring why we acted as we did, what was happening and so on. In so doing we develop sets of questions and ideas about our activities and practice. The notion of ‘repertoire’ is a key aspect of this approach. In Schön’s words:

He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation. (Schön 1983: 68)

When a practitioner makes sense of a situation he perceives to be unique, he sees it as something already present in his repertoire.

The familiar situation functions as a precedent, or a metaphor, or ... an exemplar for the unfamiliar one (Schön 1983: 138).

Understanding through the use of imagery and metaphor also accords with the “Turning the Learning Wheel” as an aid to understanding and action in this thesis (Chapter 8).

Three examples were provided in Chapter 7 in relation to the transferability of teacher attributes and creative pedagogy at the school. These were the effect of introducing orals into the Certificate of Secondary Education, the work of the Coalition of Knowledge Building Schools and the possibility of including capabilities as principles in curriculum. The first two of these have already occurred and the third is in progress.

This thesis also demonstrates that the work of the reflective practitioner can be a source of useful knowledge for other teachers, school leaders, curriculum designers and professional development agencies and in this way have the potential to change teacher practice.

Most beginning teachers also have a genuine and serious commitment to doing the job well; they want to educate. They then refine and consolidate their practice and theory through their professional careers affected by other teachers and a range of professional development opportunities. These include reading, conferences mounted by professional associations and in-service provision. Creative learning and teaching could be part of this learning and acquiring of teacher attributes.

9.1.3.2 Pre-service and inservice education.

There are two strong examples of pedagogy being the subject of pre-service and in-service education described in Part 2 Chapter 7.

There is currently a similar government funded organisation, also acknowledged in this thesis, in South Australia called “Learning to Learn”. Its strength, like the previous examples, is the sharing of methodology developed in schools amongst teachers. An employee in “Learning to Learn” worked closely with me prior to the Middle School Conference referred to earlier and presented a complementary work shop. Her opinion was that the creative pedagogy model, which includes teacher attributes, sat comfortably with the organisation’s current work.

These three examples have successfully worked to change teacher pedagogy and demonstrate the transferability of teacher attributes.

9.1.3.3 Systemic acceptance and implementation.

Creativity is obviously of pedagogical interest. It is also, in education, political and industrial in its ramifications.

It is somewhat ironical that as I write, the “National Curriculum Board” has just recommended a curriculum for Australian students that does not include the arts, music or drama. I have been advocating here that the creative teaching usually associated with arts subjects should extend across the curriculum supported by learning and neuroscientific research. The irony is increased when one recalls that the recommendations of the National Advisory Committee on Creative and Cultural Education (NACCCE) for creativity across the curriculum were also not implemented by the United Kingdom’s Government. In other words, system acceptance and implementation of a creative pedagogy seems remote. This does not preclude classroom teachers from practising the pedagogy however.

In light of the effects of the assessment driven curriculum in the United Kingdom we might even feel it incumbent on us as teachers and teachers’ organisations to implement creative pedagogy within the curriculum constraints imposed, see Appendix (9).

Professor Peter Mortimore, teacher, researcher and former director of the Institute of Education, University of London and currently a professor at the University of Southern Denmark, has recently toured Australia analysing future needs in education. He was dismissive of “high stakes” testing, and its accompanying educational justification, which prevails in schools in the United States of America and the United Kingdom. He commented that it does not produce results even in tests, pointing out that the USA and UK are at the bottom of PISA (Programme for International Student Assessment).

Instead, he made the case for an education which provides knowledge, respect, a trained mind, empathy and imagination, appreciation and character. He believed that Australia’s “education revolution” needed to be more dramatic and look to brain science and the influence and use of technology. Pertinently for this thesis he believed that teachers should not be deliverers of curriculum but creators of it.

9.1.3.4 Ongoing research.

Future research arising from this thesis could certainly be in the areas of engagement, purpose and product, in particular that of engagement, in terms of cognitive psychology and neuroscience. For example: research in respect of engagement which, as has been discussed, extended its scope from attendance and compliance to the inclusion of emotional qualities, might well extend to comparative studies of engagement in relation to routine tasks as opposed to creative ones.

The dimension of “purpose” exists currently in “Problem Based Learning”, “Productive Pedagogies”, “Inquiry Learning” and “Place Based Learning”. However, the relationship between purpose and product is not elaborated, despite the marked effect of producing something on both the purpose and engagement. The research might therefore usefully consider, in the long term, the effect of purpose, product and engagement, a creative pedagogy, in all curriculum areas, particularly science and mathematics. The emphasis in such research could be on the learning experience and language interactions in the classroom.

Outside Australia, many influential thinkers and educators are pinpointing “creativity” as a vital ingredient of education. Ilkka Tuomi is one of these:

“Third globalisation” makes innovation the key source of economic value, pushing educational systems from adaptive towards creative learning models (Tuomi 2007, pp. 235-54).

This cannot happen and be translated into reality in the classroom without a creative pedagogy. This thesis is rooted in actual classroom experience, described and transcribed, and respects most highly the classroom teacher as the ultimate agent for change and the one who can provide the opportunity to transform knowledge in order to learn.

APPENDICES

APPENDIX (1)

This appendix is the full text of the article referred to in Chapter 2 (p. 237) in relation to a much publicised and promoted view of brain development.

GIVING MUSTARD SOME PEPPER!

Dr. Fraser Mustard, Adelaide's most recent Thinker in Residence, has stated:

By the age of three a child's verbal skills have peaked ... (Education NEWS March/April 2007).

This claim brings to mind sophisticated toddlers talking sagely about the topics of the day over a cup of coffee! It is of course not the verbal skills which have peaked but rather the neurological framework, unique to humans, which allows us to talk, think, make meaning and represent the world to ourselves that has been established.

While it is certainly true that if this development does not have the chance to occur at this particular period of life it is lost, it must be noted that this is rare given that few babies have been reared in isolation alone in cellars or brought up by wolves. The mother tongue is learned naturally through social discourse.

To be fair though, the S.A. Government's investment of \$23 million in planned, new Children's' Centres is to be applauded and there is no doubt that they will be able to enrich cognitive development by providing a stimulating environment which is rich in language interactions.

The statement in the Fraser Mustard quotation that verbal skills have peaked by the age of three also conjures up tens of thousands of redundant primary and secondary teachers massing outside the Education Department. Perhaps this is the answer to the looming staffing crisis –verbal skills having peaked students can go on line; Government provided education is neither needed nor a priority!

Of course the opposite is true. It is after this period, through the rest of schooling and life, that the brain can grow in complexity. It was a previous Thinker in Residence and neuroscientist, Baroness Professor Susan Greenfield, who emphasised the importance of neural connections across the whole brain throughout life as being central to consciousness and learning and who stressed that the mind is continually changing as a result of experience and language.

What's more, there is another key time in cognitive development regarded by many neuroscientists as equally important. Neuroscientists Blakemore and Frith tell us:

If 0-3 years is seen as a major opportunity for teaching so to should 10- 15 years. During both periods particularly dramatic brain reorganisation is taking place.
(Blakemore and Frith "The Learning Brain" 2005 p.121)

At this time there is pruning in the frontal cortex, similar to what happens at approximately one year old, which affects the ability to inhibit inappropriate behaviour, plan, select actions, hold information and do two things at once. This is a significant part of students' learning from years 8 – 10; it is nothing short of the preparation for maturity.

This Middle School period is crucially important to intellectual and social growth and would also benefit enormously from increased Government funds, staff trained in modern neuroscience and smaller classes!

APPENDIX (2)

LEARNING, LANGUAGE AND CREATIVITY IN THE SCHOOL CONTEXT.

To illustrate the inter-relatedness of language, learning and creativity in a school, a piece of writing that I did during the second year of my stay at the Area School in South Australia, the site for this research.

LIFE IN A DAY:

Last lesson of the morning, but as it ends I don't go straight to lunch. The Year 9s are still discussing and planning their forthcoming play production for the Year 6s and 7s while picking up various props and costumes still on the "stage" (in reality one end of the transportable hut which we euphemistically but lovingly call our "drama studio")!

Outside now and heading for the main building, fifteen minutes left before yard duty starts and there's a Union meeting to attend in the staffroom first.

The Union's members, eating a variety of previously prepared foods from brown paper bags or neat, plastic containers are wrestling with how to put a variety of options on the use of increased, flexible staffing time, recently won by the State Branch, to the vote.

I have to go, duty time, 1.10 to 1.35, agreeing, as I hurriedly depart, that I will write up, with another member, the accepted position before Monday!

Thursday's duty is on the oval. I walk hastily past the canteen on my way through the buildings to the periphery of the school.

Suddenly, at my knees, is an abject sight. It is a five year old, clutching his green sun cap tightly as tears flow from his swollen eyes and incomprehensible sounds issue from his wobbly mouth.

Next to him is an older boy, his cap is on, red sprouts below its rim. He explains his little friend's distress,

“---fair---pushed---jashun mcardy---hat.”

I ask for a replay.

The statement was: it wasn't fair. He got pushed. He didn't get a signature on his hat from Jason McCartney.

“Who's Jason McCartney?” I ask the now assembled throng.

“Is he a pop star?”

Grins and chortles follow my question as a Year 11 student helpfully replies,

“Trust you not to know Ms McCarty, just because he doesn't play for Port Power! He plays for the Crows. He's at the school; been giving out autographs. He,” pointing at the still blubbing five year old, “got pushed out in the rush.”

Understanding at last, I enquire where the celebrity footballer is now. I learn that the Year 10s are serving him lunch (and the visiting Police Band) in the Home Economics “dining room”.

I look down at the sad, little boy whose hat is now wrung out like a miniature tea towel and say,

“Wait here, I think I can do something for you.”

He solemnly gives me his green sun cap and his silver texta.

On arrival at the “kitchen” part of the Home Economics room, I ask if Jason McCartney is having lunch. The expected, humorous remarks ensue about my intentions towards this member of my local, rival team.

Resplendent, it seems, in ALL the dark blue, red and gold accoutrements of the Adelaide AFL team, Jason McCartney sits! He is surrounded by “the boys in blue”, a fitting colour back drop. Of course he accedes to my request.

Back in the school yard, I march directly to the lone but expectant little football fan. I bend and give him the signed cap. He squeezes his whole being into an exclamation of joy as he clasps it to his chest.

The boy with red hair returns and says,

“Say thank you.”

And he does, but I know that the moment was far too great for such a common utterance.

Five minutes left of yard duty and then “The Crucible” by Arthur Miller with the Year 12 English class. Today we shall try to make the connections between the Salem witch trials and Senator Joe McCarthy’s “Un-American” activities committee...

School’s over for the day but the Year 11s and I will return at 7 p.m. to travel to the city in one of our yellow, country, school buses to see the preview of David Williamson’s latest play “After the Ball”.

The students talk animatedly on the journey down through the Hills. I hear snippets of their conversation about cars, football, girlfriends, boyfriends and the advice from a girl to a boy, “If you must swear, Nathan, swear quietly!”

Inside the theatre, and out of school uniform, our country kids are indistinguishable from the preview city crowd.

They have become devotees of David Williamson after reading “The Club” and “Don’s Party”. They’ve delighted in the reviews of this new play, by a playwright they know, in the Arts pages of the local newspaper. They’ve informed me of the promotions being run on commercial T.V. channels about the play they are going to see. We all have high expectations which I hope will be fulfilled.

We are not disappointed. The play ends, as it has proceeded, with the interwoven strands of humour and serious introspection. The questions asked of the protagonist are, to paraphrase,

“When did you last look forward to anything?”

“When did you show compassion to anybody outside your family?”

“What have you done that’s been worthwhile?”

The main character in the play, a producer of commercial films and advertisements, cannot answer these questions in the affirmative. After this, and similar days, this teacher from a country area school certainly can - confidently and resoundingly!

APPENDIX (3)

LONG TERM STUDENT SURVEY

Explanation

One of the principles in the qualitative methodology adopted for this thesis was that the data should be collected over a sustained period to enable process to be considered. In terms then of a longitudinal perspective, and as flagged in Part 2 Chapter 4, the effects of much of the learning described on the lives of seven of the students most frequently involved in the data is presented below.

These short biographies or cameos provide another distinctive perspective from the data. They make us remember with a jolt that these students live complex, sensitive lives within a changing and challenging culture. They remind us not only that these young lives are crucially affected by education in their intellectual growth, success and relationships at school, but also indicate the role creative learning and teaching can play in their future lives.

When employing authorities allow teachers to spend at least five or ten years in a school such long term perspectives on pupils their siblings and families can be held by their teachers. They can play a significant part in their reflection, planning, pedagogy and professional satisfaction. Teachers frequently take great pride in recalling the progress of students whom they once taught in relation to their subsequent lives.

These students represent a mixture of ages, abilities and backgrounds. Their names have been changed.

- Brian
- Celia
- Diana
- Julio
- Jack
- Sarah
- Shane

Five of these students were in the Year 9 class of 2001. I taught them drama for four years and English for two, in years 11 and 12. Two other students are from two other, different classes.

Short biographies

Brian

Life history

Brian had a supportive family of one sister and two parents. The parents left the sister and brother alone for almost a year when Brian was in Year 11 while they tried out a new business further from the school. The family then reunited at a general store some distance from the school. The year away was a difficult one for Brian. He learned a lot about genuine friendship as opposed to exploitative relationships. He also, as almost all students do, had to find his way through the sex, alcohol, drug, party scene. He was settled again by Year 12 and reached a score high enough to give him entry to a degree course at university. However, he deferred and immediately got work with a state wide organisation being quickly promoted to a managerial position. He has continued to perform in musical theatre.

Ability

Brian was a student greatly liked by teachers because of his infectious enthusiasm. He was good at all school work and an excellent athlete. His writing was fluent and accurate and he was a very good actor and public speaker. All of these qualities improved as he grew older. An insight into his mental and social development is provided in his contribution to the qualitative surveys.

Change

Brian's most important change, outside general maturing, was from a popular, happy go lucky youth to a popular, happy and critical young man. He became critical of his own relationships and of the world around him but in a positive way. His earlier confidence was also maintained as he grew up. I think that his experiences in English and drama supported or even catalysed these changes. Drama because of his big roles as a singer and actor in both serious and comic plays ("Dimboola" and "Happy End") and the

critical thinking work that was done during two years of secondary English. He also had a strong, supportive, sustained and intelligent group of friends.

Celia

Life history

Celia had a supportive mother and five siblings; her father visited the family from time to time. In Year 9 Celia's mother took the youngest four children, including Celia, to a small country town a considerable distance way. Celia returned determined to live near the school independently and with support from her two remaining elder brothers. Shortly afterwards she developed a serious relationship with a much older man who was a friend of her brothers. This eventually ended some two years later in Year 12. After school, Celia moved alone to Queensland where she found work in one of a successful chain of shops. She then took up kick boxing and competed in Australia and Thailand. She is currently ranked third in the world and received a bronze medal at the World Games. Although still working in retail she enrolled in a TAFE course in Personal Trainer management and is part way through the course.

Ability

Celia was always considered a very helpful student particularly good at organising events and people. She was enthusiastic and confident. Although not a fluent writer she learned adequate accuracy and was certainly creative. She was very good at home economics with its mix of organising, surveying, planning and cooking. In drama she was both an actor and stage manager. She was an outstanding leader in the SRC. She was a house captain and a very strong athlete. She passed SACE.

Change

An unusually challenging change for Celia, was obviously choosing to live independently at the age of fourteen. It was a change she managed, with support from long time friends and teachers, but the issues she faced were hard for a girl of her age. Through out this period she remained a leader of students in her class and a very strong organiser and spokesperson for students. She was optimistic about her future as an owner or manager of a business or events coordinator for a large enterprise either through a university degree or TAFE certification. The major change was when, having spent some three days with youth leaders from schools across the state in a mock

parliament experience, she acknowledged that this wasn't her world, she had found it difficult and alienating, especially the barrage of unfamiliar language and concepts even in conversation. However, Celia has continued to pursue management as a career and maintained her central intention in life: to influence people in a positive direction.

Diana

Life history

Diana had a supportive mother and one elder and one younger sister. She occasionally saw her father. By Year 12 her mother and her new partner had a baby; a step brother for the girls. In Years 11 and 12 Diana suffered from a severe eating disorder which she successfully survived with great support from her family, very supportive friends, medical and counseling staff and myself. She achieved a score at SACE that gave her the opportunity to do a BA (Arts) at university but deferred and worked full time in a dress shop where she had previously worked part time and was quickly promoted as state wide manager as well as appearing in televised programmes for the company. This experience and her considerable talent, led to national television appearances and a recording contract. She then returned to the original company working in advertising, in Sydney, and doing a degree in media and communications as an external student.

Ability

Diana was an able and conscientious student but also charismatic and sensitive. She was a state netball player and singer. She took on huge and central roles in plays and musicals. Moderators observed that she was in another league from other students. She always wanted to be a TV presenter or singer and excelled at oral, dramatic assignments in SACE English and drama. Although sometimes giving the appearance of being most concerned with clothes, make up and pop culture, she was actually a serious, hard working and highly intelligent student. She sought perfection.

Change

Diana followed a predictable course given her ability and interests. The greatest change occurred during her illness when she saw only too graphically where the desire for perfection, in appearance in this case, can lead without balance and a wider view of society and culture. While her recovery was no doubt due to professional and emotional

support, I think that the confidence she learned as a performer and the critical awareness she acquired through English may have been components in the change.

Julio

Life history

Julio lived alone with his parents; his other older siblings living nearby. Julio had an accident in the first two years of his life caused from falling down a well. He had apparently suffered some brain damage and was described as “dyslexic” although whether the two were connected is not definite. He was frequently in trouble at school and his mother would often come to the school to see the principal. Julio steadily matured and achieved SACE. He was also accepted into a TAFE centre for performing arts as a set designer. He left after three terms to take up an apprenticeship as a spray painter and panel beater in a garage. This is now close to completion.

Ability

Julio had been in a “special” class at a previous school. In Year 9 he was loud, aggressive, almost illiterate and dyslexic. He loved drawing, spray painting and playing drums. He was often in trouble during those years when he was teased and led on by other students. He found the outlet for his quite remarkable artistic and design skills in drama where he designed sets, constructed them, painted them, fixed stage lights, operated them, played the drums and acted in plays from Years 9 to 12. During this time his speaking ability was developing through the language intensity of the drama course. He eventually did English in Year 12 (one unit) and would have passed if he had finished the course but instead gave all his time to the drama SACE exam where he achieved 80% for design, construction of a set for “Equus” and an oral presentation to the external moderator. He did two wall art pieces for the school which remain.

Change

His change was a massive one from ignorance and aggression to understanding and cooperation and it was almost entirely through drama lessons and play productions where he was valued and celebrated to such an extent that he finally gained the confidence to speak, write and design at a high level for an outside examiner. His good humour was an important characteristic and one memorable and special intellectual

break through was a conceptual one when he voluntarily articulated with some pride the meaning of “satire”.

Jack

Life history

Jack was from a family of four: two parents and two brothers. He was “no trouble” to his parents because he lived for drama, comedy, different voices and acting. He had private tuition in acting. He moved through school with a closely knit group of male friends. He and one other in the group excelled academically in maths and science as well as English and drama and were therefore placed in classes with older students for some of those subjects. He and the others managed to avoid ridicule from the other students as “nerds” by being good humoured, often funny and good enough at sport.

Ability

Jack’s ability was high across the school curriculum. His focus and concentration were outstanding as was his energy and sheer delight in anything to do with creativity whether in science or drama. When he took on a major role in “The Crucible” (Danforth), the heavy weight in the play needing huge presence and maturity on the stage, the moderator thought it was played by a teacher from our school. Jack was in year 10 at the time. His script writing was well beyond what would be expected as was his reflective writing. His ability to mimic exactly was very unusual.

Change

Jack did not change but rather developed. When he arrived in year 9, he already had the courage, confidence, creativity and commitment that I try to develop in all my pupils. At the beginning of Year11, he continued in ever increasing ability and maturity, in Year 12 scored highly in the SACE examination and chose to do an Arts Science double degree at university. He has continued to perform in theatrical productions.

Sarah

Life history

Sarah has two sisters and a mother at home. She had not seen her father but believed he was Russian. Her two sisters had problems. The elder suffered serious mental breakdown with related drug abuse and the younger showed strong resistance to school.

Sarah on the other hand was academically very able, extremely hardworking, cooperative and pleasant. She has had a boyfriend for the last few years and the two support each other solidly. She had to do unpleasant factory work at weekends and other times for money. She did not finish Year 12 but sought an apprenticeship in hair dressing. This was eventually changed to enrolling in a TAFE course in office administration and management after which she gained a full time position as a secretary in a real estate company.

Ability

Sarah could easily accomplish the demands of school subjects being able to write accurately and fluently, understand concepts and generalise. She was organised and conscientious about what she was asked to do as well as showing initiative herself. She had high acting ability and cooperative group skills.

Change

Sarah's change from being more than a good student came when she had the courage and confidence to take on the role of "Tituba" in "The Crucible" and to do it to the very best of her ability. This included researching and getting the exact right coloured greasepaint for what turned out to be a West Indian slave of the period as well as a suitable wig. These were put on by her boy friend immaculately every time we performed much to the amazement of the rest of the female cast who would not have chosen to play that unattractive part for anything. They came to admire her for it. She also used recordings to get the accent perfect and with some difficulty (understandably) was able to sustain it in performance. The significance of all this was that for the first time she actually excelled; it wasn't just good it was outstanding. This confidence grew to a determination to own and run her own business. She had confidence and courage for the future.

Shane

Life history

Shane lived together with his mother and father and younger sister on a rural property. The family shared country pursuits such as horse riding with the sister, dirt bike riding with Shane and camping together with extended family in the holidays. The father and Shane shared a delight in mechanics – tractors and cars. He was also an army cadet.

Shane worked in a supermarket one night a week and at the weekend while at school. Both children were shy and without friends until the late secondary years. They were well behaved, quiet and helpful in class. Shane kept an eye on his sister while at school. He achieved SACE and then continued with his supermarket job as well as getting a full time position as a car salesman of largely four wheel drive vehicles in the city. Following this experience, Shane took up an apprenticeship in refrigeration and air conditioning.

Ability

Shane had spent some time in the “special” class at our school in earlier years. He was quiet, well behaved but practically illiterate in Year 9. However, when the class was trying to fundraise it was he who came up with the idea of a “Tupper ware” party and managed the whole process, organising the venue the time and so on. Only one parent turned up but I had seen that he was determined, well meaning and could organise. From then on he organised everything to do with stage lighting in the school for the next three years including repairs, contact with suppliers, other technical aspects of staging as well as having some major dramatic roles himself.

Change

As a result of all this responsibility, as well as the love of the tasks, he became more confident in all that he did including speaking. The breakthrough with literacy occurred in English in Year 11 when it was compulsory to read a book at home. Shane had never done this although he could read technical manuals very well and used a computer at a cracking speed. Knowing his and his father’s interest in war and the army, I suggested “Tomorrow when the war began” by John Marsden. Not only did he read this but he read all the books in the series. He later wrote poetry and stories in English and was open to the reading of novels. It was not surprising that he was picked up as a car salesman quickly. He was organised, good humoured, genuine and proficient in mechanical matters. I see management beckoning.

Discussion

These profiles not only provide a feel for the sort of students that this thesis is largely written about but also demonstrate that secondary education is far more than received

knowledge in a curriculum provided by an Education Department or secondary examination board. Even in these few examples the complexity of students' lives can be seen.

There are issues which can usefully be considered and included throughout their learning in secondary school:

- Relationships - between students; students and teachers and families. Less than half of the students in these profiles are from “traditional” families.
- The culture and economies in which they live.
- The importance of their teachers.
- The connection of drama and English, taught in a “creative” way, to confidence, courage and maturity which remained and may have helped them through changes which occurred.
- The frequency of taking on management roles in the work force for these students. (This was also the case with students whom I taught in this way at the Parks Community Education Centre some years earlier).
- The take up of tertiary education which was sought and offered to 4 out of 7 students in these profiles. Only one took up the offer straight from school, one refused and the remaining two took up their university education four years later: one as an external student.

Many of the attitudes, skills and abilities which occur repeatedly in these short biographies can be connected to the characteristics of a creative pedagogy. The acquisition of high self esteem and initiative are strongly associated with the central strand of confidence building; the management ability required and shown in all the life descriptions is a continuation of years of group and individual organisational responsibility; being able to communicate in many registers to other people emanates from the variety of literacies engaged in over a long period; and, finally, those personal characteristics of commitment, persistence, reliability, resilience and empathy practised in the process of creating products which often required considerable courage.

APPENDIX (4)

YEAR 10 DRAMA DISCUSSION ON POVERTY AND PLAYS

(Tape time indicator 1 – 6)

The class is sitting on chairs in a circle.

The teacher says, “STANDING NEAR YOUR CHAIR, SHOW ME POVERTY.”

(CIM)

A thinking time of ten seconds is allowed. (LL4)

(This is done in this way deliberately. There is no time allowed for disengagement of students on arrival.) (LE3)

- All become physically small
- All are drawn into themselves
- One uses a newspaper

The teacher asks why everybody went small and withdrawn. The answers, in summary, are that they were: ashamed, powerless, isolated from everyone else, sleeping on benches or hiding.

(This exercise and those that follow, including the discussions, are based largely on empathy.) (LE2)

(Tape time indicator 40)

The teacher says, “SITTING ON YOUR CHAIRS, SPEAK ME POVERTY.”

A thinking time of ten seconds is allowed. (LL4)

The students say:

- I've been begging and stealing
- I've been trying to find ways of keeping warm.

- I've been trying to keep warm in a doorway.
- I haven't been throwing anything away because it's very precious.
- I've been selecting rubbish bins.
- I've been scrounging for food.
- I've been walking, walking, walking, walking shoes are important.

And so on.

Each sentence was repeated in different words by the teacher and confirmed by the student with all the others listening. (CIM)

(This is partly so that everyone can hear and understand but also acts as a repetition. Occasionally the statement is rephrased to make the meaning clearer by agreement with the student.)

(Tape time indicator 81)

The teacher says, "WHY ARE PEOPLE POOR?"

A thinking time of ten seconds is allowed. (LL4)

Students offer explanations. (LL5) The teacher confirms or explores each briefly. She limits it to 6 speakers.

The students say:

- Family doesn't love you, so you leave and are poor.
- Alcohol and gambling.
- Bad things happen and you spiral downwards.
- Homeless young people.
- Sexual harassment, break up of parents and you run away.
- So poor you look forward to being jailed.

The teacher says, "That was really, really good!"

(This is a good example of an Augusto Boal "trigger" (Boal 1992) by which he means accumulation of tasks, strict structure and praise for success.)

The teacher sets up IMPROVISATIONS to be done in self chosen groups of approximately 4 students (CCO).

(This requires cooperation. Self chosen groups may be alternated with teacher chosen ones depending on the level of learning and collaboration.)

1. Poor people on a park bench.
2. Poor people in a family.
3. Poverty somewhere in the world.

(The difficulty of these three situations increases in complexity to grow confidence.)
(LE4)

These are rehearsed and then shown to the whole class. There is excitement, responsibility and the courage of performance. (LE7) The teacher requests that one of the improvisations be shown at the assembly on the following Monday for the visiting Japanese students (CPR).

(This takes the product to a wider and more challenging audience giving a sense of importance to the actor students as well as providing a purpose (CP) for them to achieve more.)

The teacher indicates it's time for a self devised PLAY on the subject of poverty in self chosen groups using costumes and props as well as setting the stage. (LL3)

One of the plays in outline:

The scene opens with girls singing "Amazing grace ... a wretch like me."

Some boys are asking for food.

Girls are praying to the Lord for help.

Two arrogant males enter referring to the beggars as "garbage".

Conversations occur between the rich boy and the person offering home to the poor.

The conversation is about what really matters – friends.

The rich boy insists he has friends to go home to

The rich boy asks who the other poor people are. They are the householder's wife and daughter.

The rich boy causes violence; assaults the daughter.

The scene changes.

The family is talking about hunting. The rich boy emerges. He is told he is "sick" and to go home, he has caused enough trouble (CO).

(The implication is that he has raped the daughter: the ultimate exploitation of rich over poor. The imagery and symbol created in the play (CM) reflect the earlier discussion on why people are poor.)

(Tape time indicator 195)

The teacher has brought scripts of excerpts of a play called "ANGEL'S CHILDREN".

(This play was performed publicly by a Year 10 class some years before which makes it credible as a performance piece and part of our tradition. There are photographs of the performance on the wall. These are looked at afterwards and comparisons are made between the acting and interpretation of the parts).

The scripts are distributed (LL7). On this occasion there is not a choice. They are rehearsed, learned and acted very vigorously and well. They are a great improvement on the improvisations (CT).

(Tape time indicator 270-378)

DISCUSSION ON THE PLAYS AND POVERTY (LL1) completes the lesson.

The teacher says, "Was any phrase different in MEANING because of the way it was said or acted?" (Referring to "Angel's Children" where two groups had chosen the same excerpt.)

Two phrases were selected. Each had been said differently in the two performances.

1. "Why do you let him boss you around?"

2. “It’s out or it’s out.”

(The discussion was about the way in which things are said: tone, emphasis on some words rather than others and how that affects their meaning. Examples were raised about how we talk to teachers and their reactions. The discussion also connects the play, poverty and real life.) (LC1)

3. Lead actors

The class was able to compare the two leads in the performances they had done as well as the lead actor in the performance four years previously which they had all seen (LL5).

(In a later lesson this discussion was continued watching a video of the public performance which is not only useful to this particular learning but also paves the way to the privilege and achievement of future public performances.)

Each lead was different because of the acting, speech and meaning conveyed.

(Teacher used word “amazing” a lot; she was learning and excited too as a teacher-learner.)

4. Sarcasm

Many of the lead’s lines were sarcastic. The nature and delivery of sarcasm was discussed (LL1).

5. Dreamy bits

These were acted similarly. There was less ambivalence here in the text, situation and character.

The teacher says, “Was there a variation in PACE in the plays?”

Examples were given of picking up pace, bringing it down, high energy and general energy. It was agreed that variety of energy is important to hold an audience; there could never be low energy. It was agreed that two groups doing the same scene at the same time was unusual but rewarding.

(This is an example of the learners being involved in and commenting on pedagogy.)
(LL2)

The teacher says, "Say something honest about the ACTING!"

The discussion included:

- The effect of the audience and nerves; script versus improvisation and the idea from a student that, "THE ACTOR WRITES THE SCRIPT." This apparent paradox was explained by the student saying that the actor gives actions and dialogue to words through interpretation (LL5) (CM).
- Some actors specially praised and clapped by the group
- "You become more intimate and less shy."
- "Because you've got to work together you work on each other's strengths and you've got more opportunity to do that in smaller groups."

At this stage the school principal who had been invited in to see the scripted scenes made some comments on the LEARNING that he had seen:

"Learning always has to do with the relationship between you, the teacher and the other students in the room."

"The partnership that the teacher sets up - the learning environment - is probably some of the best I've seen."

"All drama and productions in this school have always been meticulous."

"Everything that's happened has been about learning, sharing, giving everyone an opportunity.

Cooperation – you have to take the opportunity."

"Moving out of poverty is getting the opportunity to learn, in a country where that's possible."

"Your teacher always praises everyone at the end and is inclusive."

“You are not just learning about drama but real life issues that YOU CHOSE – THE NEW CURRICULUM – you learn it better by doing it – most of you are here because you do things.”

Comments (social and learning elements)

The learning processes observed which are found in creative learning are:

- Connections are made from the known to the new.
- Arousal and empathy occur through being stimulated and engaged.
- The role of language in thought, speech and discussion is the biggest learning component.
- The learning is often galvanized by others in a social working context.
- The power of the story is repeatedly seen.

The school principal makes the pedagogy explicit to the students at the end. The teacher frequently does that too, sometimes at the beginning, during and at the end of lessons. Students in secondary and tertiary education appreciate knowing, sharing and contributing to the pedagogy. For secondary students it seems to confirm their entry into adult learning and for tertiary students, learning to be teachers, it explicitly links pedagogy to theory. Such explicit pedagogy would be a necessary practice if creative teaching and learning were to be extended and generalised in a whole school setting or more widely,

The principal and the teacher share the view that school should not be a collection of formalities and conventions particular to the institution “school” but should be driven by learning and the processes of learning which are most successful.

- The lesson recorded (partly described and partly transcribed here) is in no way extraordinary. The principal, other teachers, school services officers, other classes frequently come in to share in the product which has been created.
- The variety of language and thinking from concrete to abstract; making connections is always present

Concrete, gut feelings:

I haven't been throwing anything away because it's very precious.

So poor you look forward to being jailed.

Generalisation, abstract concepts:

Alcohol and gambling.

Bad things happen and you spiral downwards.

Homeless young people.

Sexual harassment, break up of parents.

Connecting: (all that we have done to an originally developed abstraction.)

The actor writes the script.

- The individual and group work is always also experienced.
- The confidence grows.

The lessons are always varied in activity, exciting and arousing in a stimulating environment (lights, pictures on the wall, vocal and musical sound, costumes and props)

The story is in the created plays and the recollections in group discussion, either to provide concrete examples towards a generalisation, or towards the creation of a play's narrative. Scripted plays also engage because of the story.

APPENDIX (5)

YEAR 9 SCIENCE: TALKING TO UNDERSTAND ATOMS

RESEARCH QUESTION: Can students articulate orally their understanding of the concept of atoms bonding and what role does oral and written language play in their learning?

1. IS THE CONCEPT UNDERSTOOD WHEN SPOKEN FROM THEIR WRITTEN NOTES?
2. IS THE CONCEPT UNDERSTOOD WHEN SPEAKING AFTERWARDS WITHOUT NOTES?
3. HOW DOES THE LANGUAGE CHANGE? DOES IT MATTER?

THE CONCEPT TO BE ARTICULATED:

The original question from the teacher was, “What happens to make two nasty substances become one nice?”

The students each read from their own notes (LL6) (LL7).

They each read them out loud.

They each make a speech delivering an answer to the question (LL1).

C (reading from notes)

1. What happens is because sodium has only one negative charge on the outside shell and chlorine has seven, you need eight electrons to make an outer shell.
2. The electron on the outside of the shell of the sodium jumps the chloride to make the shell have 8 electrons on the outside.
3. The sodium has 8 electrons on the second shell so it doesn't matter when the outer shell goes away. After this occurs it is unable to have a reaction as the electrons on the electrons on the outer shell are gone.

1. *Loses way grammatically in first sentence*
2. *Lack of differentiation between chlorine and chloride*

3. *Use of word 'jumps' (from teacher) is unhelpful (?)*
4. *Use of homely phrases like 'doesn't matter' is unhelpful (?) Or is an alternative too abstract at this stage (?)*

C (explaining without her notes)

1. Mmm – what happens is there's the atoms of chlorine and sodium and on the chlorine there are 7 atoms.
2. Well, there – sodium has one electron on the outside and it jumps to the chlorine when they're put together.
3. Then because the sodium has 8 electrons on the second shell mmm that's the outer shell, and they can't have any reaction because it's therefore (?) (Unclear)

1. *Terminology varies uncertainly. Atoms used rather than electrons (or charges) on the outer chlorine shell.*
2. *Phrase 'they're put together' not concise and may hide lack of understanding of the process.*

M (reading from notes)

1. All right, so well, basically, the sodium – mmm – has like – mmm – a charge of 11 and it has 2 on its inner shell, 8 on it's outer and one on its outermost shell and then the chloride has a charge of 17 – 2 on its inner, 7 on its outermost shell.
2. So, the sodium, when they come together, the one on the sodium will jump over to the chloride making a charge of 18, I think, and filling the space, so there's no more space left, and the sodium and the chloride, the bad ones, like apart they hurt but together they're good, since there's no more room to, like for any other charges, there's no more – mmm – there's no reaction to people. Yeah, I reckon that's it.

1. *Three filler, thinking phrases and mmms are used.*
2. *'Come together', 'no more room', 'no reaction to people' again homely phrases rather than precise. Is this useful or not? 'Jump' again used from teacher's explanation. 'The bad ones' emanates from the teacher's metaphor of nice and nasty to*

explain sodium and chloride separately (nasty) and then together (nice) – is this confusing or useful metaphor?

M (explaining without her notes)

1. Yeah, OK, well you've got sodium which has a charge of 11 and on its outermost shell it's got one – mmm – charge. And the chloride which has a charge of 17 so it's got 7 on its outermost shell.
2. When they come together the one charge from the outer shell sodium jumps over to the chloride filling up all the space around it so it's got no more room for any more charges and makes it nice, the two charges making it nice, which turns it into sodium chloride.

1. Better than with notes, more fluent and more meaning: an edited version of the first attempt.

K (reading from notes)

1. When 2 nasty substances, e.g. sodium and chloride, combine they make a nice substance.
2. When they combine, one substance that has under 8 electrons on the outer shell and one that has almost 8 charges on the outer shell, with sodium having one and chloride having 7, so the last one from sodium goes to chloride and they create one other substance which is salt, sodium chloride.

- 1. Includes useful accurate, scientific (?), objective (?) words like 'combine', 'substance', 'create' and the actual product – salt!*
- 2. Teacher metaphor of nice and nasty included as if she understands it.*
- 3. Confusion with electrons and charges*
- 4. 'Goes to' phrase rather than a more specific one.*
- 5. Grammar goes in 2.*

K (explaining without her notes)

1. When two substances, when two nasty substances, combine to make one nice substance, e.g. sodium and chloride, when the one has almost 8 in the outside shell and the other has quite a lot under 8, - mmm – then one, which is sodium and chloride which is 8, they combine with each other to create a nice substance which is salt.

1. *Fluently expressed but numbers inaccurate and concept not really understood.*

J (reading from notes)

1. OK, well, take for instance, sodium and chlorine, sodium has got 11 positive charges in the middle and around there are 11 negative charges. There's 2 in one circle, 8 in another outer one and there's one in the final circle

2. This one kind of like moves or jumps across to the chlorine which has got the empty space on the outer shell and because they are all even, with 8 negative electrons in each outer sh...ring thing, they're non-reactive 'cause it's like all even and the sodium and chlorine, their (they're) ions, become, - sodium's got one positive charge and the chlorine's got one negative charge and it's actually – turns into sodium chloride which is salt.

1. *Use of hesitant phrases 'kind of', 'like', 'actually' as she talks her way into understanding (?)*

2. *Uncertainty about terms 'sh...ring thing', 'ions' abandoned and chlorine and chloride (?)*.

J (explaining without her notes)

1. There's sodium and chlorine, and sodium has got 11 positive charges in the middle, in the nucleus of the element sodium and then there's a ring thing which has got 2 negative charges, electrons, and then another one with 8 negative electrons and then there's another ring which has got one negative electron in it.

2. This electron jumps over to the chlorine or moves over to the chlorine of which the ... has got an empty space left in its outer shell which had 7 there but now because of the sodium electron moving over has now got 8 and that makes it non-reactive and

stable and there's no space left for anything to react with it and these 2 elements make sodium chloride which is also salt.

1. *More scientific words used than other students, 'nucleus', 'element', 'non-reactive', 'stable', but she's still uncertain (?) of them.*
2. *This would not be intelligible to a lay person.*

R (reading from notes)

1. The sodium has 11 positive charges and 11 negative charges so it's all evened out but on the outer ring it only has one negative when it could have 8 so it's all alone and it becomes "nasty"
2. and the chlorine has 17 positive charges and 17 negative charges so that's evened out but it has only 7 on the outer ring and it could have 8 so it has one space
3. and when the sodium's one negative charge on the outer ring joins the chlorine's space on the outer ring the sodium becomes a positive charge because it has one more positive charge than it has negatives and the chlorine becomes a negative charge because it has one more negative charge than the positives and 'cause it has filled up all the spaces on the outer ring --- become "nice".

1. *One long sentence.*
2. *'All alone' an anthropomorphic image helped by teacher's "nasty"?*
3. *'Charges' effect accurate?*

R (explaining without her notes)

1. The sodium has 11 positive charges and 11 negative charges and it only has one negative charge on the outer ring when it could have 8 which means it's all alone and it's "nasty".
2. The chlorine has 17 positive charges and 17 negative charges so that's even but it only has 7 negative charges on the outer ring so it has one space left.
3. And when the sodium joins the chlorine and fills up that one space, the sodium becomes a positive charge because it has one more positive charge than the negatives and the chlorine becomes a negative charge because it has one more negative charge

than the positives and because the outer rings are all filled up, there's no spaces left so they become "nice" so it turns into sodium chloride or salt.

1. *Broken down into more manageable sentences.*

B (explaining without his notes.)

1. There's sodium and there's chlorine and they're both "nasty". And the sodium has an outer shell and it's only got one atom there and it doesn't need it and chlorine has got an outer shell and needs one more, so sodium passes the atom to chlorine which fills that up and it loses its outer shell which makes it sodium chloride which makes it "nice".

1. *Misuse of word atom.*

2. *No notes used because more confident or hadn't bothered to do them.*

3. *Much shorter and less detailed*

4. *Concept "every day" but not accurate.*

[Perhaps what is needed is explanation in every day "homely" language where possible and an explicit learning of "scientific" words, if they are necessary, so that the students are genuinely building on what they already know but going further in knowledge and understanding. This is what is done with experience refining and articulating in English and drama. They too lead to abstraction or generalization.]

L (explains without his notes having not brought them to class.)

1. All right, mmm, well, the sodium has 11 positive charges and 11 negative charges and the chlorine has, aaa, 17 positive charges and 17 negative charges and the sodium passes over one negative charge to the chlorine which makes it 10 sodium positive and negative and 18 chlorine positive and negative and the combination of them two, which were nasty substances to start off with, the combination of those two made sodium chloride which is nice.

1. *L had done some notes.*

2. *The process is inaccurately described.*
3. *Use of a couple of scientific but also everyday words in his description.*

FINDINGS

It is unclear what the (CP) of the original learning exercise is. Firstly, there is the idea that atoms of different elements can combine chemically to form a molecule (compound) that may have very different properties from the original atoms. This is the origin of the “nasty” sodium and chlorine forming “nice” salt.

Then, without naming it, the concept of “ionic bonding” is introduced. This involves two further ideas, but only one is dealt with – the formation of “ions”. Atoms with atomic numbers (protons and hence electrons) close to the Inert or Noble Gases, may lose or gain electrons to establish a chemically more stable outer electron shell. Atoms that lose electrons become positively charged ions; those that gain electrons become negatively charged ions.

It is the attraction of these oppositely charged ions for each other that results in new compounds through Ionic Bonding, but this step appears to have been omitted.

The full story (LL3) hasn't been told, so what has been told doesn't make sense.

1. IS THE CONCEPT UNDERSTOOD WHEN SPOKEN FROM THEIR WRITTEN NOTES?

- *Despite reading from notes students still often lose their way grammatically. They need to be taught to write notes for speaking purposes. This could be done in English and Science lessons. Such writing was not appropriately taught (LL6).*

- *Confusion from most regarding specific words denoting attributes and scientific language.*

There is a need to learn these for future science learning, but via current, every day understanding and words, so that they can be used accurately. They are an important learning link between old and new knowledge. (LEX1) and (LC1) are not apparent.

- *The use of fill in and verbal planning phrases are a natural way of speaking when we need time to search for the best phrase.*

They can be eliminated with preparation, practice and knowledge.

- *Frequent use of “nasty” and “nice”.*

Teachers need to take care that metaphors or images are appropriate or let the students find their own imagery to better represent the knowledge to themselves and others. (LI2) not incorporated.

- *Use of anthropomorphic or simple everyday words for scientific processes.*

These are again an important bridge into new understanding but should be able to be dispensed with when new learning is complete unless warranted by a particular context or audience.

1. IS THE CONCEPT UNDERSTOOD WHEN SPEAKING AFTERWARDS WITHOUT NOTES?

- *Some were better without notes, more fluent and with some improvement in meaning. There was also some indication of editing. Finding your own words and talking your way into understanding was a desirable process but in this case couldn't go further because of initial unclear explanation.*

- *Almost all continued to use the same inaccurate words and phrases and fill in clauses that were evident in initial explanation with notes.*

- *The two students who either had no notes or didn't use them produced the shortest and most inaccurate explanations suggesting that the writing and using of notes may have helped to a degree. While their lack of success may be explained by their stage of brain development, it is more likely that it emanates from learned male culture, attitudes and behaviours in school, learning and science. This often presents as “cool” disengagement with learning. Its opposite would be viewed as “nerd” like and to be avoided.*

2. HOW DOES THE LANGUAGE CHANGE? DOES IT MATTER?

- *The language did not change significantly.*

- *The language might have changed most radically and importantly if during the process the students had:*

- *Begun the learning with the big picture, the exciting story, (LL3) the jig saw of which atoms and bonding are apart (LEX1).*

(This suggestion has been made informally by Professor Martin Westwell; he suggests that perhaps science should be taught starting with the big picture [story] and then go on to analyse the parts as we do in real life when we come upon a new concept.)

- *Talked more to the teacher and in small groups with the purpose of trying to understand. (LL1)*
- *Had help in making the transition between the new concept and the new words via old knowledge and old approximate words and phrases (LC1).*
- *Encouraged to ask questions themselves and find the answers in small cooperating groups. (CCO)*
- *Had had the opportunity to reflect and apply the new knowledge to their own initiated, albeit more simple, problem (CP).*
- *Presented the knowledge in a way they thought would work to the whole class using any aids they wished (CPR).*
- *The language matters because without it new learning cannot occur. (LL4)*
- *While the teacher can say there is not enough time for a language rich process, the result is that the curriculum is “done” but the science not understood.*

APPENDIX (6)

RELATED REFLECTION ON A SCIENCE CLASSROOM: DEET PROJECT

On a much larger scale, the Department of Education Employment and training (DEET) funded a project called the “Science in Schools (SIS) Research Project”. The SIS research, studying the way science is learned, identified a number of teaching components which were thought to describe effective classroom practice,

- The learning environment encourages active engagement with ideas and evidence
- Students are challenged to develop meaningful understandings
- Science is linked with students’ lives and interests
- Students individual learning needs and preferences are catered for
- Assessment is embedded within the science learning strategy
- Science is represented in its many facets
- The classroom is linked with the broader community
- Learning technologies are exploited for their learning potential

(Campbell 2006, p 18)

The teacher, who carried out this attempt at change in a science classroom, reported at the end of a year that there were problems with time, pacing, teacher isolation rather than collaboration, assessment, resources, the set up and environment of the science laboratory not being conducive to discussion, and classroom management or structuring. These points are also made in this thesis as being crucially important for creative teaching to occur effectively.

In the summary of findings Campbell states:

“Despite intense effort, students’ attitudes to Science remained essentially unchanged.”

(Campbell 2006, p 18)

In addition to the problems identified by the teacher above, the responses of the students in the class to a set of questions put to them may suggest part of the reason for this. In a

student preference survey, they identified as activities they “never” wished to undertake as:

- Doing science investigations of my own choice
- Searching for science information using library books
- Give a talk to class (Campbell 2006, p 20)

These three activities are active not passive, they engage learning because they have a purpose, they involve manipulating symbol and language and the final activity of producing a speech for a public audience needs confidence and provides pressure or challenge. These three activities are serious inclusions in creative learning.

The teacher also states,

...it wouldn't matter how stimulating your lesson was, you would be kidding yourself that you could bring and swing every child around. It is absolutely impossible (Campbell 2006, p 24).

This is of grave concern. It may be that the cultural reasons for students' attitudes to science also need to be discussed critically with the students; the cultural label of “nerd” for instance and imagery used to depict scientists in the media. A counter strategy might be to link science qualifications with purposeful, important and high status jobs, such as engineers, pilots or environmental scientists and so on. These could be provided in a number of ways to school sites by education authorities working with both universities and industry.

APPENDIX (7)

YEAR 10 DRAMA DISCUSSION IMAGES AND EXERCISES ON RACISM

(‘F’ indicates female)

T: The third social issue that you chose was “racial prejudice” and “discrimination (CP). I want to begin this afternoon with you closing your eyes and seeing a PICTURE (LI2) of racial discrimination and I want you to hold that picture and we’ll go round the circle and I want you to describe it to the rest of the class.

I’ll count 10, so I can find my picture as well.

1 ... 10 (Vocalised 1 to 3 then silence for rest of count)

What was yours C?

S1: A black person walking into a restaurant. It’s empty and they only go, ‘Sorry, not very well prepared tonight.’

T: Fantastic!

S2: I’ve got a white person walking down this like alley way and these black people come up to him.

T: Excellent.

S3: I had the same as Bruce.

S4: So, it’s like a jewellery store or something, a black person walks in. They don’t get any help from anyone. A white person comes in and they do. Like they said, ‘Can I help you sir?’ and that.

T: Perfect.

S5 (F): I see a little girl at school and she’s like Asian and she’s got no one to play with because she’s different to everyone else.

S6 (F): I pictured like, you know how you can get those ‘mail order brides’? Yeah? Some of them get put into brothels and because they’re ethnic girls they get treated really bad.

T: Very good.

S7 (F): I saw a little boy and girl being pushed around because they were a different colour or race being hassled by other people.

T: Excellent.

S8 (F): I saw people coming to Australia, trying to speak a language and there were people laughing at them when they don’t get it right. It happens ...

T: (mmm groan and in response to further addition) That happened yesterday?

S9: I saw an aboriginal trying to get a job and they didn't give it to him even though he had all the qualifications.

S10: Yeah, I saw like a black person getting picked up by white people because they're a different colour – police and that.

T: Fantastic.

S11(F): I saw a Japanese coming into a show and they didn't know much English and they were trying to talk and they were just making fun of them, like swearing at them and ...

S12 (F): Similar.

T: Me and Michael had the same picture like you two. I saw a restaurant as well. I saw a person who looked Greek or Italian or – I'm not sure what – and he was being pulled out by a white security guard and pushed out of the door.

T: This time I'd like you to think of any PHRASE, and you don't have to worry about swearing, any phrase that you hear somebody saying to somebody who is of a different race. OK? Everyone clear and can handle that? I want to hear the actual words that are used to hurt and insult somebody of a different race (Some questions of clarification here)

Yes, it might be a whole sentence; it might be a phrase; it might be a ... but if it involves a swear word I don't mind if you use that because we're trying to be real, OK?

10 seconds to think of a phrase – see a picture and hear what they are saying. That will help

(1 to 10 as before. All in silence.)

T: I'll go the other way round this time.

S1 (M Yr 7) Well, my friend told me a joke. 'What's the difference between a nigger and a ship in the bottle?' And he said, 'The bottle.'

T: Right, I'm very glad you shared that with us. Good.

S2: I've heard people say 'Fuck off you bung' to Aboriginals.

T: Excellent.

S3: I've heard 'Fuck off you black coon.'

T: Bung or coon.

S4: I heard laughter.

T: You heard laughter – good.

S5 (F): I heard 'black bung' or something.

T: Black bung again.

S6 (F): Yes, I just heard people laughing.

T: Laughing.

S7 (F): Yes, all those individual names but like after 'black'. It's always 'black' something.

T: Yes, good.

S8: Dirty, filthy because of their colour.

T: Dirty, filthy something.

S9: I've heard them called 'druggies' and just stuff like that.

T: Druggies, dirty, loser – is that one?

S: No.

T: No? Not really? No? I want to get this right. Druggies OK?

S10: Get out of here you fucking gook.

T: Gook, what race would that be?

S10: Asian.

S11: Black, just like anything black sounds like black – black bastard.

T: Thank you.

S12: 'Towel heads', 'June boons' and ...

T: You see I haven't heard any of those. Can you just say them slowly?

S12: 'Towel heads' that hat thing and 'June boons' cause they live in the sand.

T: Why is it 'June boon'?

S12: 'D u n e c o o n'.

T: Oh, so it's 'dune coon'? Right.

T: What we need to do now is to TALK through our PICTURES and our WORDS.

Now who would like to start somewhere with those words or with those pictures?

Because we have to work out why, what – what this is all about, why those words?

What have they got in common? Why those pictures? Why did we choose those?

(LL4) (LL5)

S1: Because they are always putting people down.

T: So essentially you're saying racial prejudice is putting people down?

S1: Yeah, making them feel small.

T: Why then is it always 'black'?

DISCUSSION ON TOP OF EACH OTHER:

How come black people call each other nigger?

Because there's more white people.

Because there's more white people, more black people than white People get paid...

Out

T: What we're saying is it's black in Australia but when I was in Africa there was a word for a white person which was derogatory, yuk, 'mzungu', that meant white, 'mzungu', a Swahili word. Similarly, what Ronnie (yr.7 student) said was really important. Why do some black people call themselves black?

Well, it begins with, it's a big word, it's called 'internalised oppression'. Because everybody else calls you that you use it for yourselves and that takes the hurt out of it. 'How you goin' there nigger?' And then someone else calls you nigger and it doesn't hurt because you've taken that word for yourself.

S: Like the 'wog' word.

T: Now 'wog's a very good example, thank you. Italians and Greeks were called 'wogs' in Australia for many years. Mr. Marino [the school's Principal] has been called a 'wog' millions of times and then a group of comedians did a whole show and called themselves 'wogs' and their film was called –

S: 'Wog boy'.

T: 'Wog Boy' and they say OK we'll take that word, you're not going to use that word against us, we're going to have it for ourselves – so it's a thing that happens. Excellent work. Anybody else anything?

S: I heard last year some time that some singing dancing group actually did that in one of their songs and the black community in America made a big fuss ...

S: It was Jennifer Lopez.

S: -but when they ... something said about them calling each other that ...

T: Precisely, they can say it about themselves but you don't let other people call you that. A very good example.

S: It's like if you say, it's like, for example, if you said 'I'm so fat' but if a boy turned round and said 'You're fat', she would go off her nut!

T: Precisely, it's a question of who says it. S have you got something to say before I go to C?

S: No, you can go to C.

T: C mentioned jokes. Now I thought it was wonderful that Ronnie (Yr 7 student) started off with a joke. Now I want to tell you something about jokes. A joke is always the same; the only thing that's different is the word or nationality that you put in. That joke about which is more black, brown, Pakistani ...? It doesn't matter. The joke is always the same. What's different is the nationality you put into it and it isn't funny if you put Australians in it.

There's a thousand jokes about how an Irishman is trying to change a light bulb, now everybody laughs until it's Australian – then they say 'get off it mate,' so jokes are used for what purpose then?

S: To put people down and make yourself feel good.

T: Yes and to make you laugh so you think it's OK and it makes more people racist than anything else because you say, 'It's just a joke.' 'Can't you take a joke?' and the jokes about women are just a virulent and have just as many put downs.

S: There are some pretty nasty ones about them' (CM),

T: Yes there are too. Everybody in ... it's a put down that's all you need to know – jokes are a put down,

S: (Yr. 7 student) The worst joke about black people that I ever heard is, 'What did the guy say ... what did Jesus say when he created the first black person? I should have burnt (?) one!'

T: Isn't that awful? That is so bad.

S: And that's against religion too. You know it's like ...

T: Yes, it's a put down of religion as well.

S: (Yr 7 student) I know one ...

S: Religious people feel bad. They are like a race on their own really.

T: OK, all right, well, I think everybody's aware that there are lots of jokes and I think you're all aware they can be about anybody. One last comment, yes, C?

S: There's tons of jokes about blondes and ...

T: Yep.

S: - but you can't ... shouldn't really say them, unless you're blond but if you're blond you can say them.

T: That's right but otherwise you can't.

(student indicates agreement)

T: OK, A, what did you want to say? You wanted to tell another joke did you?

S: Yeah.

T: Yes, well, all right let's hear it just in case there's something different about it. I don't want to just collect jokes this afternoon!

S: No, there's nothing different about it, it's just racial ...

(He has the concept of "racial" now – the coat hanger on which all such jokes and remarks and actions can hang unlike the year 7 student.)

T: Yes, they all fit don't they? All right I want to go back to those pictures you had now and back to the Filipino Bride because I thought that was an interesting thing to talk about. Can you tell us a bit more about it; see what people have got to say. What is this thing called "Filipino Bride"?

S: Well, lots of women are bought with money ... by ... stuff like that because for them it's their only escape and so they come and for a lot of the time they are treated really poorly by whoever buys them and they end up being very unhappy but the ones that don't make it to being Brides to somebody are put into brothels and they just make prostitutes out of them to make money for who ever owns the organisation.

T: Ah well, what do think about that? What do you think? V?

(All the examples which follow are clothes that fit on the coat hanger of racism objectified by speech and shared in discussion.) (LL1)

S: I think that poverty plays a basic part ...like C says ... not she's worthless, not so much because she's poor but because she was a different nationality(LL5).

T: You're right in saying that C in the play treated her ... first he raped her and then he treated her as if she was nothing because of her race and there's a million films and novels about this – "Jessica" [by Bruce Courtenay] which a lot of us saw a couple of weeks ago [much sympathy shown here] was about a woman who because she was poor was treated like rubbish and Aborigines who were shot at and of course they turned out to be the best people in the story! (LC1)

S (Yr7): I like Indians; Indians are awesome!

T: Ah, American Indians, is that what you mean?

S: Yes, because we saw a show ...

[tribal Indians and American settlers are described and the class gets restless at this long retelling of a film]

[T relates this to other conquered peoples such as Maoris in New Zealand and Aboriginals in Australia]

S: There's lots of those jokes about New Zealanders and sheep!

T: Yes, aren't there? There are a lot of put downs of New Zealanders.

S: Australians have twice as many sheep than New Zealand and they bought all their sheep from Australia!

T: Thanks for that.

S: About racism, when I was living in Queensland there were lots more Aboriginal people who were racist against whites and as soon as I came down here I noticed it had turned around and I was disgusted because some of the words people were using I'd never heard before and a lot of people down here are racist against Asians.

T: Yes, I want to talk about Aboriginals because the first words we heard in the circle were, the first word as an insult was "boong". I find it very hard to believe that the people who lived here 40 thousand years ago and who we invaded and conquered and were driven into living awful lives. They wouldn't have if we'd not been here. They were at one with nature, the animals, everything lived, they lived ...

S: Maybe that's where they get the idea that we are a superior race than them because like we came here and just like kicked them out.

T: When you think of how it is, that's terrible but then to then insult them by calling them theses sort of words, mmm, well, I find it the hardest thing to teach.

I manage to get most classes to look anew at most racism; I can get kids to understand that the Afghanis who came here left a terrible place and we should welcome them because if we were there then we would hate it as well, especially if you're women, but whenever I talk about aboriginals, it takes me ages, and I don't know if I ever really succeed in getting rid of their prejudice (LE3).

T: Why do you think that Australians overall seems to be more prejudiced against Aboriginals?

S: Because they bit back.

T: Because what?

S: Because they bit b...

T: But they didn't here Aboriginals haven't really bitten back in Australia...

S: Because they weren't in this...But in a way like they have. I think it's not so much them personally but the Government's given them so many benefits, there's a sort of like a jealousy sort of factor.

S: But then there are one or two people who give Aboriginals a bad name, you know how like they say petrol sniffers and all that...

T: Yes.

S: Yeah, well take one or two out of that.

S: You have to understand that kids are like that for a reason though A. They don't just think hey I might sniff petrol. The kids up at Ernabella are like that for a reason.

T: What's the reason?

S: It's because they've had a tough life you know; it's the only escape that they have

T: There's nothing to do up there guys. You get up in the morning – there is nothing.

S: It's the same at Roxby Downs, all there is to do is just drinks and ...

S: That's why they're good at footy.

S: Are you saying that if they had money they'd be you know sniffing cocaine or something?

S: No. I'm saying that because there's nothing else to do and because they've been treated poorly and they've basically been shoved up there mmm they have no escape, they have no idea how to deal with it, so the only escape, the only way of finding like a happy place is to do it.

S: Because they're kids.

S: I know because where I use to live everyone called him "boong", his real name was Thomas Wiese but everyone called him "Weasel" and he had a bike and he use to ride it round because he was homeless and he use to go to University and learn and had college degrees and everything like that and he had lots o money in the bank and had a big house – lots of cars and everything and he had...

T: Was he an Aboriginal?

S: Yeah, and then I don't know what happened but someone started saying like about him, he was abusive to his kids and he wasn't and it was a white person who said

it and then he was, the police took all his money away and he wasn't allowed to touch it, so he was left homeless, on the streets, because of one person's...

T: They were more likely to believe him (white man) because he (Weasel) was black?

S: Yes.

T: Do you have an example from "Jessica"?

S: Yes mmm everybody believed it wasn't her kid.

T: Nobody even thought that...

All right, does everybody feel they said everything they want to say at this stage?

We're going to do some acting now. (CPR)

T: [Recalling the rest of the lesson on the tape recorder when the students have just left.]

The next thing that happened was that the I pretended I did not know the group and collected the brown eyes students close to me and left the blue eyes ones across the room. This was similar to the famous American experiment which was used to demonstrate prejudice/racism. Although these students realized straightaway that some separation was going on for some reason, one of them actually said, one of the brown eyes favoured ones, "It's because I'm a good actor!" and one of the blue eyed rejected ones said, "You don't know us!!" So, in a short time they had fulfilled exactly what one would expect from being discriminated against. They became resentful and conflict could have followed. The experiment was then described to the students. (LL1)

We then went into 2s or 3s and did three freezes the second two of which came to life. (LI2)

The first one was showing gross sexual discrimination and assault. This freeze was very strong using their hands to pint, poke and hurt. There were fists snarling looks and so on. (LE2)

The second was a medium form of discrimination where people deliberately turned away, moved away and even spat. (LE7)

The third was the subtle sort of racial discrimination which can occur and this was just the blink of an eye or in one case it was just moving to take up a seat to make sure somebody didn't sit next to you and so on.

TAPE ENDS

APPENDIX (8)

SURVEYS, QUESTIONNAIRES AND OBSERVATIONS

The Responses

Adult responses

These surveys ranged from short almost practical responses to lengthy and reflective ones. The salient points under the headings provided are these:

(1) Confidence (2) Creativity:

DD: The students (Year 9 drama) were all without exception very confident by the end of the term. Students who have shown a lack of confidence in other areas [of the school curriculum] shone (BC).

Most students showed creativity by the end of the term. This happened when they had to create situations with very few, if any, props (OC).

CM: Before I move on to discuss the question of students' (Year 12 English and Year 9 drama) confidence; it is relevant to note your own strengths. Part of this is the confidence you impart to others (BC). It is an essential part of the process. I think you would claim this is not just about a confident personality but rather about the professional use of an acquired set of skills. But from my understanding, once skills move from the state of being simply well executed to the next stage which I would describe as being the point at which they are transcended into something greatly affirming, things get imparted. When skills are submerged by an affirming presence they are quickly passed on to others. This skill quality is something you clearly bring to teaching.

To the question of [student] confidence, one has to say that very early in the piece I observed you make a short exposition, something of your own educational philosophy, with respect to the teaching of drama in particular, in a manner that not only overwhelmingly affirmed and reinforced a class of Year 9 students in their ability to

perform but this was then wonderfully displayed in a high level of skill frequently evidenced in the class room. The creative level displayed by many students was very high. It led you into incorporating students' ideas into a school performance arrangement (OC). The levels of confidence operating within this class created a very strong impression of skills emerging, to the levels where the students concerned may be classified as highly gifted. When this creative level is achieved, transfer occurs. This transfer does not just take place in isolation. It flows from teacher to students and among students in rapport with each other. Confidence starts to flow as liquid energy and even to the extent of billowing like creative wind. As a teacher, this inventive level of activity was encouraging and exciting; encouraging as a teacher upon reflection, and exciting as a participant (E).”

(3) Reflection (4) Language (5) Student formation (6) Relationships and (7) Product

DD: Reflection was always interesting. At the beginning and end of each lesson the students came into a circle and had to make comments about what they did and how they felt about it.

All kinds of language were used by the end of term. Students planned their small plays and peer instruction was obvious. It was interesting to note those students who were natural leaders in drama.

Most students worked well individually and were excellent in their small groups that came together in the end in the one play ‘The Royal Adelaide Show’.

This is where I noticed the sometimes drastic change in these students. I have followed this class regularly for two years and I have never seen some of them as well behaved and respectful with any other teacher. There were some students, who are often in trouble in other classes, behaving totally differently. The teacher treated the students with respect (R) and dignity and had no pre-conceived ideas about them.”

The class worked in several groups at first and then came together to present a play to other students. This gave them a goal to work toward and a sense of achievement at the end (OC).

CM: The following comments are based upon my observation of your Year 12 English class in the context of ‘viewing’ and ‘analysing’ “The adventures of Priscilla Queen of the desert” [for SACE stage 2]. Clearly and frequently periods of reflection operated as

a standard feature which was encouraged among students in this class. On varying occasions when you and I had opportunity for discussion, you outlined the heart of your methodology, much of which seems reflected in these questions. ...as I recall this episode of you teaching, a great deal of what you are enquiring about in these questions was reflected here.

The initial response to 'Priscilla' started with small groups. The process of students working singly, in small groups and with the class as a whole in a plenary session quite impressed me. You may well recall my observations about the class interactions. You may also remember I expressed strong surprise at how well the class interacted. I am not sure how clearly I told you previously, but I was initially almost stunned –I was very impressed- at the level of mutual respect which operated between you and your class (R).”

The quality of your class relationships was observed in a number of ways. The maturity of relationships was one definitive factor. Your strong relationships developed with individual students were quite stark compared with those sadly too frequently experienced by students. But this quality, which I have variously termed maturity and respect (R), equally operated between individual students in various class formations.”

The product in this instance was to quickly facilitate student 'reviews' on 'Priscilla' and the allocation of marks. Time does not permit, but there were a unique set of skills you displayed to support students and readily enable them to complete goals and outcomes to a high degree.

(8) Teacher qualities (9) Replicable by another teacher?

DD: The teacher was patient, respectful and dignified (R). Her mere presence meant that she had control of the class. She earned their respect within the first lesson.”

I have been present while other teachers have taught drama to this class and they did not have the same results (T neg). However, with the same curriculum and methods used perhaps.

CM: Concerning your question about the transferability of your teaching philosophy and techniques the obvious answer to this question is a definitive yes! (T) Logically they must be transferable. The question of how this is to be encouraged and promoted I consider to be a vital question. Our discussions and the opportunity provided by

working together have been particularly encouraging. It was such a pleasant reminder that the qualities displayed in your classroom can potentially be the common experience of all students.

(10) Use of space

CM: One unique feature about the use of space was with regard to, what I am going to call, informality. Simply this, many teachers hide behind the formal structures in the way they use space. While you use all the forms, one had the sense that the class was quite naturally agreeing with you with regard to the appropriate spatial forms for use. Equally, the natural converse arrangement applied. You frequently agreed with class members. This mirrored the above use of classroom space. You led the class. But they worked with you (CL). Their use of space reflected this.

Student responses

1. Confidence

- Great deal of confidence because it teaches you how to perform;
- Gives me more confidence because I can speak my mind;
- Allows me the chance to take on the role of another character but build my self confidence at the same time;
- Wasn't previously good at talking in front of big crowds or reading out loud to others.
- Drama has allowed me to open up a lot more and increase my confidence. I believe it has been a healthy outlet during my schooling years for emotions, leisure and energy. The social side of drama is great as you get to meet many new people, which can also boost confidence. In particular, drama has helped me to discover things about who I am, as you can portray characters in your own creative way
(BC x 5).

2. Creative

- I now write many plays with my friends and on my own;
- I think drama made me more creative because I got in touch with my inner mind;

- English and drama give you the chance to create your own art by self expression;
- We don't just do work we get to create things like building sets and designing things;
- Drama and English have been my only subjects that have no standard boundaries. You are able to reflect, recall and relive your own feelings, emotions and stories. They also gave me the opportunity to portray my personality through both acting and writing
(OC x 5).

3. Reflection

- It helped us to understand and learn more of what we performed
- It achieved more confidence out of me to talk; (OT)
- To look at various aspects of learning on different levels and use opinions of others to reach a conclusion;
- I reflected on a lot of things, when I learned about satire was one of the things that stands out;
- Drama and English go hand in hand on many levels. The thing that has been concreted in my mind mostly is always to be critical and have a voiced opinion. Even when doing simple things like watching day time television, I question little things about the actors, the choreographed movements and even the people in the background
(CR);

4. Language

- We talked about almost anything a teenager must go through. I think it's important because it helps you relate to people better;
- Not until I was allowed to so I knew what I was doing. You can share ideas and get the best possible answer;
- By talking we can see different interpretations from others and use their opinions to discuss issues. It is valuable because interaction with others gives you a chance to learn from others and work together to produce a better product;
- We talked about important issues to us and to the world and it helped us learn. It's important to talk in lessons because I'm a person that learns better by listening;

- Talking is one of the best things about drama and English. It is fun and you get to not only voice your thoughts and feelings, but also listen and interpret other people's opinions. Not only is it fun, I feel it is a critical component of these subjects, and should perhaps be use in other subjects more.* Group discussions about issues, controversial opinions, thoughts and even one-on-one talking with students or teachers are some of the types of speaking that I found useful in drama and English. Talking is the best way of learning for me. Asking and answering questions and describing things are such useful techniques in learning (OT x 5).

5. Physical Formation (individual, group and class?)

- Yes. It teaches us not to be dependent on others and cooperation;
- Yes. Get my talent out there and get rid of my butterflies;
- Yes. It is valuable because interaction with others gives you a chance to learn from others and work together to produce a better product;
- Yes. It helps you get to know your fellow students very well (F)
- Yes. We worked as individuals, groups and as a class in both subjects a lot. It was valuable because it gave us the opportunity to work and voice ourselves in different possible circumstances in which we may find ourselves in the not too distant future;

6. Relationships

- It is a very friendly atmosphere; no one puts anybody down;
- I usually work with the same group so I don't know about everyone;
- Ms McCarty is a good friend to all of us on both a teaching and social level. I get along with most students, particularly with my close friends;
- I have a good relationship with my fellow students and they help me if I cannot spell something. The relationship I have with the teacher is very open and confident. I can confide in her about any thing;
- When we go to both English and drama the atmosphere is friendly, because we all speak and open up to the other students and the teacher and I feel I know them all so well as people. I have developed a valuable friendship with my teacher, which I hope will not end after school. It is so important to not only relate to the other students, but also the teacher. They too have valuable voices and opinions (F x 5)

7. Product, Learning And Behaviour

- We usually worked towards a small play; (helped learning) because we had something to do so we did it; it got everyone working (OC)
- The product was to make people laugh; laughter is a disease you can't always stop; we couldn't always do scenes [serious] because of it;
- Yes (product) because if I have any questions I know I can speak to Ms McCarty about it and not have her judge me but rather do what she can to help; (R)
- I'm not quite sure but I know when we did a major play and it was successful, it was good enough (OC);
- I believe the product I worked towards was the task at hand. In drama especially, I wanted to produce work that I thought was to the best of my ability. I'm not sure about the other students but I was constantly pouring my heart into everything I attempted in drama. With English I was aiming at preparing myself; for the world beyond school, such as : relating different things, portraying myself on paper, my grammar skills and presenting my work in a well structured and viable way. Sometimes it had an effect on my mood and behavior because the work is tough and requires a lot of thought (OC)

8. Teacher Characteristics

- Friendly, critical in a good way, helpful, understanding;
- Honesty,[com]passion to teach (P), and willingness to put up with us;
- Friendliness, intellectual, understanding, non-bias;
- A very nice person, do anything for anyone, funny, happy, always got a smile on her face, if you ask her to help she will always find time and she is very committed to what she does (F x 2);
- Talkative, friendly, driving, inspirational, efficient, helpful, understanding, able to relate her work to personal experience, knowledgeable, effective, genuine and nice, a 'real' person – values her relationships with students, wants to help others etc., willing (R);

9. Replicable By Other Teacher?

- No, because everyone got something done with the teacher and no one was afraid of performing;
- Not all, she had more experience and patience than most teachers I know;

- No, Ms McCarty opens up more than any other teachers and makes the effort to be our friend. Others don't;
- No, I have dealt with a lot of teachers and they don't have the same approach with students
- No, Ms McCarty was like no other teacher I have ever had. She strove to get the best results from her students in not only her school time but even in personal time. She was willing to give out her phone number to students when they needed help. The main thing I feel that Ms McCarty was special for was for being our friend. She got to know each of us on a level other than school. It was personal and each friendship was different with other students (F).

10. Use Of Space

- First we talked about what we were doing, then we made short plays, and then reflected on them;
- By going in separate corners and practicing our plays;
- Ms McCarty always got us to sit in a circle so that we could discuss issues as a group (OT);
- We all had comfortable space because we had big rooms;
- We generally sat in circles or so that everyone could see each other. This was good because when discussing we could talk directly to people. It also helped build my confidence because when you were speaking, you couldn't hide behind someone or something, you had to just speak. This had a positive influence on my public speaking and my ability to talk in groups;
- Always put in more than she is required; helps those with less understanding and gives them more of a chance to learn.

Other:

Voluntary responses from adults and one older student as observer

JS (Student observer)

(2) Creative

The girls seem to need costume and props for the best outcome, even in boy/girl groups [NB there are many examples where boys groups do this – my experience is that it has more to do with getting started than just the act of dressing up or using props.]

The students like to use props as what they are not. Like a feather duster for a parrot. It makes things more interesting.

They like to use ideas from other plays that they have done like this group of boys, who ever since they started have had someone come out and talk to the audience at different parts of the play.

(6) Students

All seem very enthusiastic to be in the class (E)

(7) Product and its effect

Students have the opportunity to design their play around or to a piece of music (sound). Most of the time this has an almost totally positive effect on the students' work making it more fun than most of the time. It would be interesting to know what effect music all or most of the time would be like. [NB this opportunity to use music builds on a whole lesson in year 9 drama where we learn how to integrate music and sound effects into plays. This use of a piece of music of my choosing in year 10 leads on to the students choosing music/sound effects whenever they choose to as they progress in their playmaking and play production.]

(4) Language

Tim's group's play about the murders at the pub "Privates investigator!" is the only one I saw that did not start with conversation. Most plays I have seen started with the students talking amongst one another and then making the play from the ideas from the conversation (OT)." [NB This was such a tightly knit group of boys that it is probable they had been talking about their play over night and during the day before the lesson. Their work was exceptional as can be seen elsewhere in this thesis.]

AD (SSO and former student)

(8) Teacher:

As one of your students I was inspired. Now as a colleague you are what I aspire to be. As an educator you are passionate about what you teach and the way you teach it (P).

You are persistent, thorough, caring and understanding. Your lessons are full of drama, humour and energy – it's like being in a play! Your enthusiasm is contagious.

Former student responses

MP (former student) CORRESPONDENCE

I'm now 46, a professional musician and a college lecturer, with four young children, and a major part of my intellectual and philosophical development was due to your inspirational teaching back in the 70s. I hope you are that Clare McCarty, because I've always wanted the chance to say thank you for what you did for me.

Between the time of you sending me this piece of writing and me replying, we have seen Hurricane Katrina wipe away New Orleans and its surroundings, and all the issues you raise about abuse of the environment come up, together with a sense of Nature striking back. Then all the issues you opened my eyes to back in the seventies about inequality and racism burst back into the picture; who is bearing the brunt of the disaster? The poor, mostly black, people and the elderly. This will happen more and more often in the next few years, and it won't be easy to turn it around.

You might have predicted I joined Greenpeace back in the 80s, and remain a supporter. I'm also a long-time member of the Musicians Union, which I'm able to promote at the College to new working musos. I always try to remain positive about the possibility for change - I have to with four children!

I found an old English exercise book, and was amazed and appalled at how almost every piece I did for you ended in an atomic Armageddon - irrespective of the subjects you set us. Part of this was a lazy boy's easy way to end any story, but it was also a measure of how I truly perceived the most likely end for all of us at the time was a nuclear one. It's good to see that somehow we escaped that particular ending.

Thank you for sending me your Styx piece [an article I wrote about logging native forests in Tasmania in the Styx Valley CMCC] - for those with a Classical background,

there's that extra resonance, and in fact it wasn't until a little way in that I realised this was Tasmania and not the Greek Underworld.

(2) Creative

Your use of the word "vivid" transports me back thirty years - it was always my favourite comment from you, and yet it's only now working with young people trying to write their own songs that I'm consciously translating that into working with their senses, getting to make me see or smell or feel what they want to express. I spent some time working with meditation and consciousness, and for me the key to making sense out of it, to making it a useful process, was always the visualisation and the symbology. Your piece works on several levels for me, because it reads like a mythological journey, but it also is sharply and not pleasantly sensual - I can taste the poison, and smell the burning.

Simple slogans can briefly stir an already committed crowd towards some common objective, but a crowd will always disperse. Writing like your Styx piece causes much deeper changes in your audience, and the impulse to positive action you inspire can last a lifetime.

I've always come back to Creativity in my own work, so I'd love to read your thesis when it's done. This week I'm grading dissertations from my group of students on their BA degree in Composition for Media. I did a degree in English at Queen Mary College, London, back in 79-81, but only this year has academic discourse has come back into what I do; up to now, even with Higher Education courses, my input has been more empowering people technically and creatively to get themselves up and running as musicians and composers - this year I had my first ex-students get a top three single, and many others have their own labels or production companies. I never related much to entrepreneurs, but now we have a model where the musical proletariat have taken control of the means, not only of production, but of distribution too.

(7) Product and (8) Teacher

We both seem to have a driving need to spend our energy on what we believe to be worthwhile, so it's a wonderful thing to be able to compare notes after all this time. I'm so pleased you've survived and thrived over there, especially after all you taught me.

ZENNY DHANANI (former student) CORRESPONDENCE

(2) Creativity and (8) Teacher

I first encountered Clare at my secondary school in Uganda. It was a new school year and I was about to commence my A-Levels.

English was a particularly favourite subject of mine and I was eager to meet my new teacher for that subject. I was not to be disappointed.

Clare turned out to be a brilliant teacher. Her teaching methodology was innovative and extremely creative. She was able to bring out the best in all of us, not only academically but as human beings. She was a mentor in the true sense of the word.

The questions she encouraged us to ask made us look deeper into the human condition. How for example did some of the classics we were studying reflect our current world at the time? What were the paradigms? What were the metaphors? Were they a reflection of our times, and if so, in what specific ways? How could we adapt the plays we were studying to embrace the African culture we were all part of yet without losing the essence of the work itself?

Another example of Clare innovative presentations was the use of some of the contemporary singers' (of that era) song lyrics versus poems by well-known writers to encourage us to carry out a contrastive analysis and to discover similarities and/or differences. These methods may not seem so unusual these days, but then they truly were unconventional.

All in all Clare's lessons had an intensity that excited stimulated and developed her students' minds to the full. Her lessons created a genuine learning environment, full of surprise and delight (E), where encouragement and praise were the order of the day and where our own (i.e. the students') emergent expertise was, to us, a revelation in itself.

Personally, I am greatly indebted to Clare and her English classes. She taught me to think for myself, to examine issues without bigotry, to be open-minded and celebrate

diversity. She facilitated me into vaster perceptual worlds than it would have otherwise been possible.

Responses from whole classes

YEAR 9 DRAMA.

Views expressed at the end of the costumes lessons in response to the question, “Why do you like learning drama?”

- o Good teacher (R)
- o Not forced to do it – like it
- o Want to do it
- o Good surroundings
- o Photos on walls - know what to expect
- o Enjoy it
- o It's fun x 5 (E x 5)
- o Like dressing up
- o Making stories
- o Use your imagination x 2 (OC x 4)
- o Say what you think (OT)
- o Work with others/groups/especially always with one friend (CL) (F)
- o YOUR ideas
- o Practical
- o Hands on
- o Little writing
- o Be yourself (x2)
- o Do what you want
- o Cooperative(CL)
- o Not boring
- o Not hard marking
- o Encouraged (BC)

A survey of all students in a year 10 class at the end of a term

YEAR 10 QUESTIONNAIRE

The questions were:

1. Describe three or more things you have learned in drama this term. They can be about acting or working in drama or about issues.
2. Why do you like drama lessons? What things do we do that make you like it? Give as many reasons and examples as you can.
3. In what ways is drama different from other lessons? Think of as many as you can and give examples.

The most frequently commented upon aspects which were valued were:

- FUN AND EXCITING
- EXPRESSING MYSELF
- BUILDING CONFIDENCE
- ISSUES
- GROUPS
- LEARNING
- DISCUSSION
- HANDS ON

In their own words:

FUN

Drama is fun – this is a big friendly class to work with – the atmosphere is fun

Fun - a close drama class

Interesting and fun

It is more fun and practical than other lessons

It's exciting – it never gets boring – the enthusiasm of everyone gets and makes the atmosphere so much better

I can release my energy through drama – I come out of the lesson depressed because it has finished

Its fun

Its very enjoyable and interesting subject - fun and exciting –fun and exciting (Ex7)

EXPRESSING MYSELF

A chance to express my ideas –

We get to express ourselves in acting and we can't do that in any other lesson

Express yourself instead of sitting in front of a desk and writing all day

To express myself – have my opinion and work out the best way to do things to my abilities

Express my feelings and emotions - release my energy

Speak freely and express my feelings

Express my feelings and emotions towards the topic

Express myself and be different characters

Problem solving and self expression (OTx9)

It's all up to us

BUILDING CONFIDENCE

Confidence, drama does that to you, it really helps you discover yourself.

I like to think that drama may help build some confidence in myself

It boosts our confidence

It helps a lot with confidence; people I know that used to be quiet are now loud because of drama

It brings out confidence that I don't have in other subjects

It helps you to higher your self esteem

I feel more self confident in myself

Drama does a lot for your confidence; my brother has come along way from being quiet and shy and not a people person to a loud, friendly people person

It teaches you to be confident

No put downs when acting.

(BC x 10)

ISSUES

I have learnt how to be another character, in a way we have to be taught how other people live, poverty, unemployment etc

I've learned that not all crimes are extremely bad except rape which is against someone's will.

I've learned about racist issues and to take it very seriously

We have learned about several controversial topics

You learn more about certain issues. The issues that we talk about make you think about it a bit more such as poverty, crime etc. You get to understand what they are actually like by acting them out.

Drama allows people to understand about the past, present and future in different ways.

I learnt about the different crimes, like arson, robbery, drugs, murder, rape ...and homosexuality. It is a very important topic that everyone should be aware of.

I've learned about serious issues happening in this world e.g. the nuclear threats in Pakistan and India, homosexuality on the streets and how people treat them, illicit drug use and why people use them, poverty and more presently crime.

Drama gives me something other lessons cannot; you learn a lot about current issues and have fun at the same time.

We've been discussing things about poverty, homeless people and wealth, how people have stolen to feed their family (CR x 10)

We have long discussions that never get boring

GROUPS

Working with other people and doing a play together

I have learned to work well in groups

Working with groups

Working with people

A lot of different people to work with

Working together (CL x 6)

You get the chance to voice your opinions and talk as a group that's mature (OT)

LEARNING

The best thing about drama is that is all about creativity (OC)

There isn't much written work but you are still learning things

We get respect from Ms McCarty (R) and she treats us like adults whereas other teachers expect us to know nothing and be stupid. Drama lets us show our maturity

It improves your speaking. It helps your mind to think and spark ideas (OT)

You learn different methods and styles of acting

You learn more about certain issues. You learn heaps without writing a whole load of stuff

I feel that I'm teaching myself not teachers teaching me. I have learnt a lot about the lights. I still have a lot to learn and I am hoping to learn as much as I can.

In drama you learn by talking and telling your piece (OT)

Even when we do writing it's interesting

You are forever learning something new about yourself.

It really helps you to discover yourself through others' words or our own words and improvisation. Drama is an intellectual subject.

Through Drama you can learn most any subject.

Drama provides for self development and our own ability to help others grow and become mature intellectual beings.

We are challenged; we have to really use our brain, the subject's all about problem solving.

DISCUSSION

I enjoy the discussions we have. Ms McCarty will say, "Let's have a quick discussion!"

There is no such thing as a short discussion in our class because everyone in our group has a large intellectual capacity and "discussion" invites the group to contribute a piece of their mind and we have long discussions which never get boring because everyone is so "on the mark" when discussion is brought on.

In drama every Monday we get into a big circle and talk about the topic we are about to learn (taken from student generated topics at the beginning of the term CMcC)

It is an excellent lesson for discussing issues and converting them into plays

PRACTICAL

I think you learn more with hands on work than theory work

I am trying to help everyone by setting up lights and installing them so they can see and help people when I leave

It's hands on in a way

I love practical lessons. I've learned to use freezes more in plays and to improvise with props.

APPENDIX (9)

This appendix provides a personal and more expansive view of the points made in relation to assessment driven curriculum towards the end of Chapter 9 (p. 237).

PAINTING BY NUMBERS: JOINING UP THE DOTS.

Creativity is obviously of pedagogical interest. It is also, in education, political and industrial in its ramifications.

As a child, painting by numbers always felt unsatisfactory. It wasn't mine and I didn't much like the result. Similarly, when asked to join dots, the result was without significance; there wasn't even any mystery in it after the first few lines.

So why did parents and teachers give us these tasks? To keep us quiet? Busy work? Possibly, but more likely it was for dexterity and precision when using our pencils on paper.

Would we have learned the same skills from doing our own line drawings or our own coloured in pictures? Would it have mattered? Is it possible that the skills versus creativity debate is not the main game here but rather assessment and control of both teachers and pupils?

All of which provides a good metaphor for the process of Curriculum Reform, assessment and reporting in the United Kingdom and now in its early stages in Australia.

The politically stated drive for a National Curriculum in the UK was for "standards". In Australia, Prime Minister John Howard and Federal Minister for Education Brendan Nelson have already entered this territory with the imposition of Flags in playgrounds (tied to the receipt of funding), listed publicly displayed values in schools and, more seriously, through a series of Acts of Parliament increased public disclosure of teacher information, frequent student tests and a changed reporting system (also tied to funding).

There is no doubt that this mirrors the UK's "National Curriculum" introduced by the Government of Margaret Thatcher in the late 1980s. The NC identified core subjects (English, Maths and Science), skills, time limits, content and courses. It could be summed up as prescription and predictability with the emphasis on teaching not learning. Ironically, when visiting the USSR in 1962, as a student teacher, I recall the group of educators accompanying me being aghast when we were informed that the government could guarantee that at any time in any school it was possible to say exactly what was being taught!

The assessment and reporting regimes established in the UK and continued largely until today are criteria based (formerly noted on grids on the teacher's desk). Students experience 400 tests by the end of their schooling. National tests occur at 5,7,11, 14 and 16; the results are compared at the school, in the locality and published nationally as school league tables. Some obvious results are teachers teaching to the test and some schools being popular and overcrowded while others diminish in numbers and resourcing. In some localities this phenomenon affects house prices! External inspection, becoming more and more regular if the school fails to improve, leads eventually to schools being under "Special Measures" and without progress finally closed.

A colleague in England reports that when parents attend "parent nights" they talk about getting their child's level from 4 to 5, for example, and when students are asked what they did during the term in English they refer to the number of their level. My students when asked a similar question talked about their favorite novel "1984" and how they would never watch TV in the same way again, particularly advertising, because they were now critical viewers!

In South Australia in April 2006, junior primary teachers are being required by the Department of Education and Children's Services (DECS) to collect data on their pupils. They are instructed to provide text to the child and then test understanding some time later and record the results. This is anathema to junior primary teachers who realise the importance of associating text or symbol with knowing, feeling, connectedness to real life and that it should be done through the senses as well as

cooperatively, creatively and individually. They have sought the protection of their Union to ban the data collection. The request was granted at a meeting of the Union's State Council of delegates from across South Australia and from all levels of education. For them the instruction was threat to creative pedagogy and was certainly a political. It came from the State Minister but as a result of federal intervention. It was also an industrial issue in terms of work load. Most concern though was professional. This instruction was seen as political, not educational, control of teaching and learning.

The colleague also reported that the greatest enemy of these curricular reforms by the Government was clearly creativity by and from students and teachers. This serves to underline the necessity for central Educational Policy directions particularly for creativity recommendations.

Back to my initial metaphor, you become highly skilled when you work creatively – creativity and skills are not mutually exclusive; in fact skills are more likely to be developed from an intention to create by the maker rather than from an exercise set by a teacher or a system. The core subjects can and should be taught creatively. The real game is the government's intention to control teaching not to enhance learning. As the colleague concluded, UK students do well in tests in competitions. However, they do less well in tests of independent and lateral thinking and making – key abilities in any society surely.

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