

CHAPTER 5

THE INDIVIDUAL EXPERIENCE OF LEARNING BREAKTHROUGH

INTRODUCTION

In this chapter are presented the individual experiences of learning breakthrough for each of the eight participant learners. The information for this chapter is taken from three sources as follows.

1. The verified transcripts of each individual participant's interview, (Appendix B).
2. The analysis of each individual participant's interview, (Appendix C).
3. The transcript of the group interview, (Appendix D).

The material is presented for each of the eight participants using the three aspects of the conceptual framework, namely the context of breakthrough, the types of learning and the experience of breakthrough.

The report of experiences is ordered alphabetically by pseudonyms given to each participating learner: Coral, Gary, Jack, Melinda, Neil, Norm, Tina and Warren.

The adult learning terms developed for the conceptual framework are used as a general structure for the information. The contextual analysis in each case follows the sequence of terms: Environmental Factors, Learning Situation, Social Situation, Influence of Teacher, Learning Aids and Characteristics of Adult Learners. The types of learning reported generally follow the sequence of their occurrence: Motor Skills, Communicative Skills, Verbal Information, Cognitive Strategies, Intellectual Skills and Attitudes. The experience of breakthrough is reported using the adult learning terms in a general sequence: Encounter, Information Processing, Impact and Transformation.

Verbatim statements made by each participant to illustrate their perceptions of their learning breakthrough are indicated in italics - any additional material appearing in brackets.

The analysis reported here forms the basis for identifying common feature of the experiences of learning breakthrough reported in Chapter Six.

THE INDIVIDUAL EXPERIENCE OF LEARNING BREAKTHROUGH

Coral

Coral, who is between 40 and 45 years of age, works as a residential care officer with the Queensland Department of Family Services, Aboriginal and Islander Affairs. Her work entails writing and implementing instructional programs for people with multiple disabilities. At the time of the interview, she was completing an external Arts Degree with the aim of improving her status within the Department.

Coral's learning breakthrough meant she could remember masses of information for answering exam questions. When Coral was initially approached and the phenomenon of learning breakthrough was described to her by the researcher, she immediately remembered her experience of poor exam results before and distinctions after the breakthrough. In the process of overcoming an inadequacy for remembering study material, Coral discovered a method for using acronyms to assist memory. She explained that acronyms helped her focus on a word in which the letters, making up the word, represented pertinent information about the ideas read from the texts she was given for her studies.

The learning breakthrough experience had impressed her so much that she did not hesitate to participate in this study.

Context of Breakthrough

The environment at the local TAFE college where Coral experienced breakthrough was a class room set up for conducting examinations. Students were in isolation from each other and provided with a desk and chair. The environment illustrates how Coral was in a learning situation that was quiet, organised and constraining.

To set the scene leading up to learning breakthrough, Coral reports a self-managed academic learning situation. She was enrolled in a formal external university course, and, in the social situation, worked alone without any tutors. Specific to her learning breakthrough experience, however, was a convincing aid in the form of a book dealing with study problems and the methods successful students use to overcome problems. The system for study explained in the book provided Coral with a way of overcoming her problems retaining and then recalling large amounts of information. She reports *...reading something and thought; 'Yeah, that would suit that'*. She used the book to acquire the knowledge of the study system which was the subject in her learning breakthrough, illustrating that Coral was prepared with this knowledge prior to learning breakthrough.

An examination supervisor and other students were present. However, Coral was unable to talk to other students or move around the room. The circumstances for her had not changed. She was still working alone and she had to rely on her own resources for learning.

To build confidence to complete her Arts Degree, Coral says she needed to find a method for study. In her perception of the events prior to the learning breakthrough, she reports how she concentrated on a search for a method to study effectively. Coral describes an individual learning endeavour in which learning breakthrough was the outcome. The endeavour is seen here as an informal pursuit intentionally happening alongside her formal studies.

Implied in her report is a single focus on methods for study and developing for herself a skill, firstly, to memorise and, secondly, to recall information. Coral says *...I realised that I had to work out a system for retaining information. There was just so much for me to remember*. Inferred here are motives, because she indicated that she felt more justified putting time and effort in the method for study having determined that

course material was irrelevant to her needs. Coral reports *...In normal daily life I would not have come across that sort of thing (study material). I don't even apply that sort of information now at work.* Coral's desire was to achieve higher grades not knowledge, so her motivation was toward being able to pass exams with a grade of distinction. What is presumed is Coral deliberately making a positive change through reorienting her efforts to solve the problem rather than focusing on cramming knowledge which may not be useful. Her focus was on learning to study. The course of study was a side issue.

One characteristic of this adult learner is inadequacy. She felt unable to retain the necessary amount of study material to achieve at the highest level of university grades. She seemed to be hindered and unable to study from, she says, *...a lack of study over many years.* What she was doing, she says, was *...trying to recall the whole lot off-pat, that is, the masses of study material.* However, she remembered feeling self-assured once she understood the situation. Coral describes her emotion at the time and her barrier to learning as: *I looked at it and freaked. There was so much information that I had to retain.*

In the period before learning breakthrough, Coral went on to explain her actions to change the situation. She decided that the best approach was to *...breed success to keep going.* She certainly indicated determination by searching *...out a system for retaining information.* As she explains, she was compelled (*...I had to...*) if she was to give herself a chance. Determination was a characteristic evident in the lead up to her learning breakthrough and a characteristic presumed of successful adult learners with a motivation to succeed. She says she *...knew what [she] wanted to do and [she] was determined to keep at it until [she] could do it.*

At the moment learning breakthrough occurred, it is seen from her report that Coral was unsure of her ability to remember information. She says that *...when it first happened I was not sure that it would work.* In addition, she had to reluctantly remember *...unimportant information...* under the pressure of exams. Coral was apparently unsure of the effectiveness of her system at the time when she was engrossed in an examination. Her response and engagement with learning breakthrough is seen to occur in a context of daring. She reports *...I thought that I would give this a go.*

She wanted known that under the pressure of examination and in her active cognitive state at exam time, she applied the system and to her surprise information flowed and she was delighted to find that she had broken her learning barrier - a barrier seen to be part of the context for experiencing learning breakthrough.

In summarising her feelings, she was motivated in her previous activities, unsure just prior to and during learning breakthrough, and elated just after the experience - an affective dimension in the context of her learning breakthrough.

Type of Learning

Coral's learning breakthrough was demonstrating the application of a rule, an intellectual skill she used for completing complex written exam answers. By retrieving from memory masses of information there are other learning outcomes as the following attests.

Coral's learning breakthrough was presumably associated with a series of learning incidents which need to be explored to find what other learning occurred in support and what Coral sees as her learning breakthrough. The first type of learning was recognising her needs, that is, to realise something about herself. The type of learning seen here as recognition is a cognitive strategy used in this way to *...realise that [she] had to work out a system for retaining information*. This strategy is the first evidence of learning from Coral's report and is a starting point for describing the learning which followed to take Coral to the point of learning breakthrough itself.

Coral provides an explanation of the study system. By describing the system, it will help the reader understand what Coral describes as learning throughout the following discussion. She describes a system using acronyms to prompt her memory, for example:

There is the term RACE which is Research Action ??? something and Evaluation. I have trouble recalling it. It is in the social sciences in social research. I write the word RACE vertically and then on my scribble paper I put Research Action Coordination Evaluation (she remembered the missing word). Then to put it onto the exam paper, if that was the question, I would proceed to explain research in full.

Coral describes using acronyms of the first letters of the key words within the text which she required to remember. The key words provided a clue to the theme or idea needed to answer examination questions which were relevant to the material represented by an acronym.

For Coral to experience a learning breakthrough through using the system, she would have, firstly, comprehended what the system could do for her. For example, would it only help with remembering just letters or words from the material in her text books or would it mean that she could remember the acronyms, the key words and what they symbolised? The latter being preferred. In her report, she mentioned applying the system to test her comprehension. Coral remembers that *...it must have been one specific area that it applied to really easily. I found that...it must have been while I was reading something and I thought: 'Yeah, that would suit that', and there-after I used that system.* Apparently, she had created a rule for her interpretation of the best use of the system - an intellectual skill. In addition to the rule, she developed a concept of acronyms representing a class of information - a theme or concept property of the information from study material. This defined concept intellectual skill was seen to develop with rule creation prior to the learning breakthrough. What Coral goes on to explain was her rule creation. She says she *...associates a word beginning with the first letter of the key words in that area. Then, because I could recall that key word, I had the first letter of each one of those key words. I fill in the key words and then I find it easy to fill in the words either side to ...to remember the whole section.* It is argued here that in creating the rule Coral used a higher-order rule which is interpreted by the researcher as an outcome occurring prior to learning breakthrough. The point is that this now illustrates where the rule, used at learning breakthrough, originated.

The application of this rule in the first instance before breakthrough, is seen to result from an internal process where she says she *...associates a word...* - a cognitive strategy used in this new way to reinforce her understanding of the system and produce confidence in its application.

Regarding remembering study material, in Coral's words she brought it out *...from the back (pointing to the back of her head) I got the information simply through reading study guides and text books. I'd start writing it and it would come back.* She is seen here to learn to use a cognitive strategy in a new way through associating, with an acronym, memorised information of

the sort that was irrelevant to what she formed with the acronym - that makes the process work. She used a motor skill to write and a communicative skill to translate the verbal information onto the examination paper.

There is seen, however, another cognitive strategy, one where Coral presumably associated the rule with the problem - to value the rule as a means of reaching a solution to remembering masses of information. What Coral says is: *I wasn't sure that it would work. But I thought that I would give this a go and it was when I came to exam time that I was asked a question that I had thought: 'Boy, I'll never remember all that', but I applied the system on my scribble paper and it was so easy to write off and I thought: Wow, this is the way to do it.* It is not clarified which association occurred first or just when she applied the rule because both cognitive strategies are seen here occurring simultaneously as a central internally directed strategy in Coral's learning breakthrough.

Coral learnt confidence which is a type of learning identified in the conceptual framework as 'attitude' as she developed her cognitive strategy and succeeded with distinctions in her examination results.

Experience of Breakthrough

Coral's experience of learning breakthrough was changed with feeling. Where prior to the breakthrough she says: *I had thought: 'Boy, I'll never remember all that'.* She goes on to report: *but I applied the system on my scribble paper and it was so easy to write off and I thought: 'Wow, this is the way to do it'.* She could not recall the necessary mass of information for completing a university exam until the barrier was lifted. Learning breakthrough is seen as a release, a feeling of relief having achieved what she set out to achieve. The information which she found impractical and difficult to remember was remembered. The encounter was relatively sudden. This is interpreted from what Coral emphasises as the time between applying the system and her realisation of success.

Coral reports making words out of acronyms. Words, she implies she could remember. She explains that *...(the prompt) may have been that the key words had been underlined or something like that, I can't recall, but for some reason I looked at that and I thought well that spells BRAT or something like that and so I wrote them down.*

Coral went on to say that the acronyms were *...rather abstract because the words (forming acronyms) have no tangible meaning...* Coral remembered examples of words during the interview to demonstrate her memory of acronyms. It can be argued that she originally achieved memorisation through a process of reinforcement *...getting a pictorial image or to visualise the letters because I've concentrated on getting those letters into the brain.* Coral goes on to explain *...making a word of nonsense meaning.* There is two discrete processes in her perception of events. They relate to recording information in memory. The first was creating for herself a visual impression and the second was the use of word sounds, that was, Coral says *...making a word....* She apparently memorised acronyms as tangible words with a label not as intangible words made of many letters. Interpreted, this process of reinforcement is association learning. In conceptual framework terms, this is seen as an information process which Coral experienced and which she brought to the learning breakthrough event as part of the processes preparing her for examination.

In the process of learning evidence of the selection of cognitive strategies arises in what she reports here as *...filling in the words either side to complete my exam paper...* and what she reports earlier in the foregoing section as *...associates a word...* Presumed as an information process experience is selecting cognitive strategies to retrieve information from memory.

There is seen a process of change. In chronological sequence it occurred as follows: Coral memorised the acronyms, practised using her newly found system, thought about using it on exams, tried it and found success. The motive driving the change, she reveals, was *...to achieve for (her) own personal self-esteem*

She found the study system through recalling something she read. It was a system *...to retain a series of information* from a book named 'Page-A-Minute Memory Book'. Reading *...about that system...*, she implies, was part of the prior learning process used to capture relevant information.

Learning was expected because of her preparation and because Coral reports deliberately trying the system during an examination. Confidence using the system for remembering masses of information from memory during an examination, when she expected more problems writing a

complete answer, however, is reported as unexpected along with the ease for retrieving all the information necessary for a high grading.

There was evidence from her report that a change occurred to her self-concept as a result of learning breakthrough. She says *...it breed success to keep going*. Coral reveals, that the experience motivated her to get a better job, and, at the time of interview, reports that *...she was in the job now and doing the practical*. The impact of learning breakthrough may be seen here as Coral progressing towards her full self-actualisation. It is argued, too, that this confidence now determines her approach to future examinations, that is, she says: *...I find it easy to fill in the words either side to complete my exam papers. It suites me and I've been able to work on that basis ever since*.

Her enjoyment of the experience is expressed as *...wow, this is the way to do it*. Learning breakthrough, for Coral, was experienced as a positive emotion.

Transformation was the result of the assimilation of the system and her successful use of it. She responded in the group review session by saying that transformation *...changes from learning [the system] to being a process and part of me and the way I operate*. She went further during the group session to explain that *...it is automatic. I automatically do it, now with the lectures that I get*. Before her learning breakthrough she spoke about the system as being a system in a book that she read and tried for her own interest. Now, after learning breakthrough, she has appropriated the system as her own.

Gary

Gary is a 45 to 50 year old high school teacher with an avid interest in political economic theory. Over time he has developed his own views of economic rationalism and seeks continually, to refine and build his theory. Talking of reasons for his interest, Gary says *it is probably a crack-pot idea, but, it's my crack-pot idea*.

From the interview, it was apparent that Gary is against economic rationalism. He became stirred at the thought of politic/economic theory intruding into our society. In addition, what he conveyed as his motive for pursuing knowledge and a deeper understanding of the subject was not to

teach, but to satisfy a personal need to *come up with a logical consistent argument about this economic theory*. It is during his pursuit of a broader understanding of economic rationalism and an intellectual challenge to achieve an understanding that Gary experienced a learning breakthrough.

Gary is a very fit person who exercises often for relaxation and fitness. He told the researcher that he jogs and plays sport whenever the opportunity arises. His active life style is relevant for this study because Gary's learning breakthrough occurred during a jogging session.

Gary's breakthrough was learning to restructure his understanding of economic rationalism to accommodate previously contradictory information and ideas from economic news reports.

Context of Breakthrough

The context in which Gary experienced learning breakthrough was in a familiar environment doing preferred activities.

Gary described his situation at the time of the event as being preoccupied with jogging around a sports oval. The social context for Gary's learning breakthrough was solitude and his learning breakthrough occurred informally.

The sports oval was a familiar place. Gary says, it was a quiet environment in which to think because he says *...I can be reading a news paper and I can see these political events evolving with the result that they annoy and upset me to the point where I'll put on my joggers and my shorts and I will burn it (the emotion), off jogging*. He reflects and perceives such times at the oval as where he *...inevitably at that time on the oval that I feel that I have got the grasp of it (matters of concern) because that is the time when I feel good about it (what he is doing)*. When in such learning situations, he was often successful in solving problems because he adds that *...some of my best thinking and realising answers comes when I am actually running around an oval*. He went on to explain that jogging and being on the oval was like a *...'detox' style of thing...where I feel released from it*. From what he was saying prior to this, that is, *...I'm really saying that it is a relief*, 'it' was Gary's stress from the problem and 'detox' was his explanation of a form of activity relieving him of the stress.

In addition, he says the oval was where he could *...get away (rather) than going there to solve the problem. I don't necessarily go to solve the problem.* The context which emerges here is Gary learning in a relaxed way - an emotional characteristic of this adult learner.

Although Gary reported feeling calm around the time of his breakthrough, that was, *...more or less completely out of it and thinking about the whole thing...it is a totally relaxed state*, he also says he felt a *...rush of energy*. He reports *...a heightened awareness and exhilaration...* at the time of breakthrough. May be the rush of energy was before his learning breakthrough because Gary reports *...if I were to check it out, when I get excited by an idea I'm probably actually running faster. Putting out of your mind such things as being fatigued or getting tired.* However, from his remark about *...pondering the problem for some time prior to that...* a rush of energy may not have occurred before the event. Gary reports relaxing after learning breakthrough. He says, for example, that *...the point about (reaching a climax) is that you can feel so relaxed from the situation when you reckon that you have thought something through. So I generally finish the session.* It is now argued that the rush of energy was during the time he was excited at the prospect of finding a solution, during learning breakthrough.

Gary went into the breakthrough situation with prior knowledge of his subject, as he puts it, it was *...probably building a sort of structure for you when you do get the pieces that link it together.* A characteristic of adult learners is to possess a level of competence specifically embodied in the subject, topic or skill in which learning occurs. Gary's competence level was prior knowledge of his subject, fitness, and an ability to manipulate information. Learning breakthrough happened when Gary was ready to learn.

Type of Learning

Gary's breakthrough was an intellectual skill described here as a defined concept to contextualise incoherent information on which to develop a consistent version of his theory of economic rationalism. In association with the intellectual skill are other learnt outcomes described as follows.

The first record of learning; was demonstrated through reading. The type of learning is seen as a communicative skill used to scan material to collect the verbal information which played a part in the learning breakthrough. His cognitive experience of selectively perceiving the relevance of news reports is seen to occur along with reading. Gary reports that *...I can be reading a newspaper and I can see these political events evolving. I have been a politically active thinker about some of the things (concerning political issues) that have been in news papers, bulletins and keeping my ear to the ground. I am also an avid reader of this stuff...things that you come across a little later should fit into this thing and if they aren't fitting into your theory you believe that you have missed something.* From his explanation of his formation of a theory, he made distinctions about what was understood and what was not understood. Perhaps he deduced verbal information in a new way, perhaps not. However, for now it is presumed that he did use the cognitive strategy in a new way to identify inconsistencies. There is, then, an outcome to be identified which is distinguishing verbal information of a type which conflicts with Gary's theory. The result was Gary concluding that his theory was inadequate to explain the difference between what he knew and what he could not explain.

Speaking generally, Gary made some reflective comments on his ideas of what he believes are the most likely times learners' are apt to experience breakthroughs. He did this perhaps to understand his own learning breakthrough, but, what emerged was a deeper insight into his own cognitive processes. He says *...I am a great believer that the real breakthroughs in humanity probably come from reflection and looking at things.* About arousing or manipulating information in memory he reports that *...it is almost as if the information you are sieving all the time...like the size of the mesh that you are using to sieve is dependent very much upon your interest.* An outcome seen to be embedded in Gary's learning breakthrough is a cognitive strategy because, in addition to the reflections reported above, Gary says *...I think I got a good grip of it one afternoon when I found that the 'penny dropped'.* He says he was *...reasoning from a macro point of view to try and see if it fitted into a much broader picture...the time when [you] feel good about it and suddenly: 'Yes, I see how that fits together now.'...suddenly picking up the relationships.* From what Gary reports, the step in the process as he began to develop a defined concept for the restructure of his theory was a new use of the cognitive strategy to associate

his theory with previously misunderstood information. He is seen here to try to associate concepts before making a connection. Both strategies, that is, associate concepts and discerning a connection are cognitive and apparently used as part of his breakthrough. The result was a pattern, (seen later) - a defined concept of contextualisation interpreted in this study as an intellectual skill.

Gary is seen now to develop a new attitude and outcome from forming his theory. He has a new belief in the effectiveness of his theory to explain other information. This belief was an attitude learnt as an outcome of learning breakthrough.

Experience of Breakthrough

Gary's learning breakthrough was experienced as a conscious new understanding, as he puts it, *...I think I got a good grip of it one afternoon when I found that the 'penny dropped'*. He describes the experience as sudden. Gary says: *...it was almost like putting a jigsaw puzzle together and all those things that interest you and the things that you try and seek out, you find the answers eventually ...all of a sudden you've got the key piece to plug it together*. Gary was always looking for an answer, but, he did not predict learning breakthrough. The event was unexpected because he did not set out to have a breakthrough. In addition, learning breakthrough was sudden as identified above. Gary remembered and expresses the quality as *...the speed at which the ideas came at that point...it is a genuine thrill of the first time of relating things in a way that as far as you know it has never been done before*.

During the group session with the other participants in the study, there was mention of a barrier to learning in each of the learning breakthrough experiences. Gary comments that with *...all the cases that I have heard, we all had this frustration, that is, you were not getting there and you had to know what it was about and you did not know what the end result necessarily was*. Gary's barrier prior to breakthrough was being unable to incorporate new information in his theory. Gary reports that his search for answers *...was trying to build an understanding of the processes involved as well as coming up with a logically consistent argument about this economic theory*.

What impacted on Gary to break the barrier was the realisation of modifying his schema of economic rationalism to re-organise old information - *...it modifies your original viewpoint.*

The change in his theory after learning breakthrough became apparent from comments he made concerning the pattern of re-orientation to his new theory. What Gary explains is an *...almost instant assimilation of so much knowledge* and further that *...[breakthrough] is when you get that step up to a greater understanding of what you have been looking and thinking about. Therefore, you've got some answers to all sorts of questions that may not have been totally related before, but, you can suddenly pick up the relationships.* Interpreted from what he says is a new meaning perspective which was Gary's way for perceiving further information in terms of a new theory - an experience of personal change.

In addition, he is seen to appropriate his new theory. Making it his own. By the very nature of the theory being seen to be able to explain the political affairs of the day Gary had developed an expertise in his way of theorising economic rationalism. *It is like*, he says, *a kick that you get to keep you in this mode of thinking.* Gary could accept the old information now as his own having *...a logically consistent argument about this economic theory.*

Concerning the moment, Gary says *...I'm more or less completely out of it and I'm thinking about the whole thing (jogging, the environment around him, his feelings, his theory and so on).* Gary also says that *...there was also enormous release. I got a good buzz out of it.* The experience was enjoyable because he also reports *...it is a genuine thrill.* He goes on to say that it was *...a sort of free-for-all...no structure...you have not been led by the nose...it was obligation free...it was personalised....* An impact here was self-achievement, demonstrated through Gary's own ability to learn without the help of others.

Gary reports that he learned to relax while jogging, he came to associate jogging with relaxing. He says, by going to the oval, it was *...a time when I can be relaxed. I don't work well under pressure.* Whether association or attitude, the point here is that the prior learning was internally processed as association learning - an information process experience effecting his reaction to the problem.

Where others may describe talking without sound as thinking and that may well be correct, but the researcher, because of the conceptual framework chosen for describing the phenomenon of learning breakthrough, describes Gary's report of similar behaviour as communicative skill. Gary was communicating, to himself, issues which needed emphasising - a form of accompaniment in which to focus his thought and think about economics while jogging. He says that he...*talks as if I would be talking to you now with out the sound. There is nothing visual. I guess the reaction to me is that I talk to myself. I do, I talk to myself. You want to say: 'Well this is how it fits etc'. Gary goes on to say that he ...is a verbal person and likes to learn that way...* The communicative skill is seen as an interaction with himself to aid his concentration.

The point raised in the foregoing section about a *...rush of energy...*, is seen to be a process experience of a physiological nature helping Gary engage cognitively. The feature drawn here is physiological quality of learning breakthrough and part of the information process experience brought to the learning breakthrough.

To demonstrate his understanding Gary reports verbalising the old re-ordered contextualised information in terms of his developed theory. Gary says that talking about it was *...more-or-less a revelation of: '...look this is what I've discovered what do you reckon about it?'* He talked over his newly constructed theory with his wife on returning home to test his new theory. Talking was seen as Gary reinforcing his understanding. Reinforcement, as the intended outcome for articulating the theory, was part of the process by which Gary confirmed his theory.

Jack

Jack was in his late teens when he reported experiencing a learning breakthrough. He was attending first year apprentice Fitting and Turning classes at the local Technical and Further Education (TAFE) college. These classes were part of his apprenticeship training obligation where he developed trade skills.

The breakthrough occurred towards the end of 1992 and what he learnt was a new technique for welding runs and fillets on steel plate to industry standards. Jack was interviewed on 20 April 1993, a few months after his learning breakthrough. He had no apparent problems remembering the events associated with his experience.

Jack's breakthrough was learning to weld two pieces of steel plate in the correct way, but not before he accepted the teacher's way of welding rather than his father's way. What changed was demonstrated in applying the new skill to his work. He had gained distinctions in his apprenticeship exams and developed an expertise back at his work place for solving welding problems.

Context of Breakthrough

The context of Jack's learning breakthrough was practical rather than theoretical or academic. He was learning to weld the correct way in an off-the-job vocational learning situation.

The environment for learning was a college workshop set up for vocational training. The equipment, or learning aids, was a welder and the welding head or hand piece. Jack makes the additional point that the circumstances were not new, ... *the workshop was good ... and he ...liked it there, it helped. All of the apprentices that were doing college at the same time were from Walkers (where Jack works) and everybody knew everybody.* Jack suggests that the classroom context provided an atmosphere that was conducive to, and supportive of, learning.

He reports that he was involved in a disciplined program of instruction in a formal setting having a specialist classroom teacher of welding directing and assessing his development. It was a situation where Jack had no choice other than engage in learning.

There were other people who were an influence on Jack's learning breakthrough. Jack explains ... *with work mates, if you do a bad job you would get pretty badly rubbished by them. That sort of gets you to persevere on and get better than them.* The influence, he indicates, caused an egotistical reaction to criticism which is seen to motivate him to succeed - as

he says, the help came *...from within myself I suppose, the competitiveness or maybe the influence of not wanting the rubbishing or both*. He goes on to say that his *...goal was to be the best ...* and in saying this he conveys determination, a characteristic of this adult learner needing to achieve with excellence in the competitive atmosphere he refers to at college. Jack reveals that *...there was a few of us that were sort of high and competed with each other. That created rivalry and competition*.

Two social situations are identified for comment, one before and one during his breakthrough. The first was a large group situation and the second was a one-on-one situation with his teacher - a context playing a supportive role where he could *...walk around looking at other students working (observing) different ways of doing things...* and where the teacher could work with Jack on aspects peculiar to Jack's problem.

Jack felt it important to explain his inappropriate habits brought with him to the learning breakthrough experience. This was a broader context in which Jack experienced learning in welding. Jack describes how he had a mind-set for welding using an inferior technique *...picking up bad habits by the way that (his father) was teaching (him)...* - a barrier in the context for his learning.

Jack goes on to explain how he was challenged by his classroom teacher and by doing so the teacher provided a learning challenge which led to Jack's learning breakthrough. His teacher, Jack reports, put the challenge that *...you do a run your way and I'll hold your hand and guide you in the way that I think it should be done, then you judge*. Jack said *...I compared them and found that his way was better using his technique*. The influence of the classroom teacher through his own ability to demonstrate best practice provided a model which Jack could duplicate, and in so doing realise the potential for using the new technique prior to actually processing the technique himself. The result was confidence in the teacher. Jack says his breakthrough was *...through learning a better technique from the experience of the teacher*. Jack goes on to express his feelings about himself at the time as *...I felt a bit clever and a bit more confident. Confidence boosts you up. I began to think that, well I must be able to do this and I must be able to do this a lot better and I must be able to vertically up weld a lot better using this technique as well*. Confidence is seen here to provide a positive attitude towards his task and learning. The point made is that Jack assumed an active role in his own learning.

In summary, the context in which Jack experienced learning breakthrough was a familiar work place, relevant exercises, a challenge through the prospect of being better than his peers, and confidence in his own ability and that of his teacher.

Type of Learning

The learning breakthrough for Jack was the convergence of (a) an attitude change to adapt to a new way as against an old way of welding, (b) recognition of a better way to weld, (c) discrimination and (d) demonstrating fine and gross motor skills.

Regarding the motor skill outcome of breakthrough it is clarified in Jack's report as *...the skill of doing the run and the skill of the way I was to hold the hand piece and then the tricks with the visor and the way that you can actually move your wrist and so forth*. Jack had learnt as a consequence of learning breakthrough a manipulative technical skill - a fine motor skill in terms of the conceptual framework. Jack notes: *you sort of look to strike your ark, close your eyes as you strike the ark then you shut the visor on the helmet all in the one action...I wasn't doing that when I was doing a lousy job*, and gross motor, he says *...the skill of doing the run*.

Jack reveals he developed knowledge of various techniques through observing other students. He says he would walk *...around looking at other students working. Everybody has a different way of doing things and you tend to think: "Yeah! that is not bad, I will try that."*. Essentially, this observational way of gaining knowledge was a process of information gathering. However, there was also a necessary learning outcome because he would have had to recognise particular aspects of the work performed by other students. Learning to recognise such matters is a new cognitive strategy.

Jack adapted to the new way of welding - an attitude acquired at learning breakthrough. Through a forced situation imposed by the teacher, that is, he was instructed *...do it this way* Jack discovered that his welding *...began to improve*, and was determined to accept the new technique. He says *..This is maybe the best way?...it wiped the old habits*. He was able to distinguish difference between the qualities of one example of welding with

another. Jack says *...I compared them (the examples from the classroom teacher and his own) and found that his (the teacher's), way was better using his technique....* The ability to recognise a distinction is a cognitive strategy, learnt perhaps as a child and brought to the learning breakthrough, but, used here in a new way as a learnt outcome to apply this strategy for adapting to new techniques in welding.

There remained an elusive learning process. The researcher, therefore, asked Jack specifically "In what skill did you experience breakthrough?". Jack replied *...that initial hurdle...(was) the skill of doing the run and the skill of the way I was to hold the hand piece and then the tricks with the visor and the way that you can actually move your wrist and so forth.* Jack identifies a fine motor skill for manipulating the visor and hand piece. However, Jack also notes a cognitive dimension. He refers to tools present in the event as an explanation of what he was doing and the types of learning used to comprehend information. There was, he says, *...a hand piece... and the mind was the other tool and a combination of both,* and goes on to say *...so if I hold it this way and do it that way and experiment with it...* In accounting for Jack's view of what happened where *...the mind was the other tool...*, it is presumed the tool was cognition and the analysis of quality concepts was perhaps the cognitive strategy Jack identified earlier and described it as experimenting. In analysing, he made a connection between the way he was doing the job and the teacher's way - distinguishing difference. Thoughtfully analysing the quality concepts was the central internal process learnt in his learning breakthrough - a cognitive strategy. The demonstration of an externally directed discrimination, an intellectual skill to decide between the teacher's way and his father's way, where the cognitive outcome of recognition, analysis and distinction was internally directed. Along with the intellectual skill and cognitive strategies, the fine motor skill for manipulating the visor and hand piece happen simultaneously.

Determining the worth of the new skill in welding steel plate in novel industrial situations, which Jack also reports, is a defined concept developed sometime after his learning breakthrough, and can be seen as Jack developing his trade skills and becoming proficient at welding to industry standards.

Experience of Breakthrough

Jack learnt a vocational skill experienced as a release of innate ability. It was the product of developing attitudes, cognitive strategies, intellectual skills and physical coordination..

Jack's report suggests that the learning breakthrough which added significantly to his ability to weld was expected, but, the timing and the specific nature of the skill to weld using a new technique not just an improvement on the old was unexpected.

Jack refers to a sudden experience. In response to the researcher asking if he thought that a breakthrough was the only way he could have learnt the new technique, Jack replied *...I may have still had the breakthrough, but, certainly not as quick. You might have stumbled through it working at it in your own way, but, probably the technique would not be as good and take twice as long.*

Jack's experience of breakthrough essentially broke a learning barrier. He makes reference to *...getting over hurdles...* and *...overcoming barriers...*. He goes on to explain that *...when I forgot the way Dad taught me and concentrated on the way the teacher taught, it wiped the old habits.* Interpreted here as the impact, *...wiping old habits...* was a release for Jack to become trade competent.

The information process involved observing other students' working to develop his own technique. Jack says he *...walked around looking at other students working...(observed) different ways of doing things...then mixed it all up together and came up with my own way of doing it.* In addition, emerging from what he says about the mind being a tool and associating facts to make a connection is seen here as association learning - information processing in terms of the way Jack experienced his learning breakthrough. The cognitive strategies which are reported above as utilised in a new way were presumed to have been learnt previously. Cognitive strategies were presumably selected from somewhere for Jack to develop them under new circumstances. The process of selection is selective perception and a process of learning experienced with learning breakthrough.

Jack goes on to explain how learning breakthrough impacted on his current performance using a welder. He had learnt through modifying his technique...*tricks of the trade*, for example *...closing your eyes as you strike the ark then you shut the visor on the helmet all in the one action*. In addition, he explains that *...when I got better I came across some small problems with different properties in metals. The smaller problems you seem to overcome quicker than the initial problem because you have that background experience*. Jack had learnt a new ease for operating the equipment which in turn were useful in solving further welding problems.

In addition, Jack reports an emotional impact. He *...felt a bit clever and a bit more confident. Confidence boosts you up*. It can be presumed from this that learning breakthrough was a pleasant experience at the same time building confidence. This is seen as Jack learning an attitude which was not present prior to learning breakthrough. Jack was inspired to emulate the quality of technique for welding, displayed by his classroom teacher. In Jack's words he reflects that: *Through learning a better technique (my work got better) from the experience of the teacher*.

The transformation Jack experienced was a new perspective for using the new skills. What Jack says about *...acquiring your own style* provides a report of assimilating the new technique for himself to become 'second nature' or an intuitive skill preferred to be seen in vocational fields as making him trade competent. Jack goes on to describe how he became trade efficient because, as he says, *...It was as if your mind says: and we'll put it in the head and lock it away and then it will become second nature...you are not physically concentrating, it is in your mind and it just happens - like driving a car...you are bound to do it the way you are most comfortable with*. What was a re-orientation of his thinking about himself as a tradesman is seen to be transferred to the workplace.

Melinda

Melinda was, at the time of her interview, between 30 and 35 years of age. Her occupation, until recently, was in television where she worked as a news reader and host of a daytime current affairs program. She now works freelance as an advertising consultant. Her personal interests are in the performing arts, as well as teaching dance.

Melinda's learning breakthrough occurred in February 1993 while composing a musical program for a staged ballet performance using a local amateur theatre group, professional performers, and a dance troupe which she teaches. The task of composing entailed choreography, writing a program of scripts, selected music and dance numbers, choosing costumes, and props.

The interview with Melinda was conducted on 4 March 1993, just a few months after the experience. She spoke openly about her experience providing a comprehensive report.

Melinda's breakthrough was learning to develop a coherent theatrical program from a set of disparate elements between and including...*limitations of (her) environment, the talent that was at hand, the technical facilities that were available and (being able) to work within that framework.* The dance sequences were all choreographed by her. These sequences were part of the problem because she could not, before breakthrough, make them part of the overall program. Melinda says her concerns were that she needed to *...transfer (the demands of staged performances) to those people who are not professional.* She had to work within the framework of finding a balance between the abilities of her dancers and the professionalism needed for a successful performance including writing a program which met the needs of all performers both professionals, and amateurs, like the people in her dance troupe.

Context of Breakthrough

The context in which Melinda experienced her learning breakthrough was a personal cognitive challenge.

Melinda's environment was her own home. The environment provided familiar territory. The day and time, inferred by the researcher, was ideal for learning because Melinda was relaxed and fresh. Melinda says *...Sundays are usually spent with a leisurely morning alone in the house. My husband goes to cricket.* She reports *...starting on the program in the morning ...about an hour after waking.* In addition, she was engaged in an informal activity where she worked independently at her own pace.

In the social context she was alone, there was no teacher nor tutor. What Melinda describes is her preferred informal situation in which to learn.

Melinda already understood what was required of the theatrical production. She explains that *...she is an experienced choreographer...* and as far as the choice of music was concerned at breakthrough she had the knowledge, she says *...I admit it felt like a weight had been lifted after being at my mum's (because the music part of the program came together)*. The skills and knowledge were previously developed and were brought to the learning breakthrough experience as a characteristic of this adult learner's competence.

To Melinda, the prospect of writing a program for a major theatrical production was challenging. She also implies she enjoys choreography. She says *...I love taking on fresh challenges - there was this excitement*. As the problems mounted so did her motivation. As she says towards the time of her breakthrough *...on the line is my reputation as a choreographer*. Two motivating influences were drawn on by Melinda. The first was the challenge and excitement and the second was a compulsion. Motivation and a compulsion to persist are emotive characteristics of this adult learner.

There were problems before learning breakthrough. Melinda began to realise the enormity of the task. There were times of desperation, times where, she says *...It seemed like: no matter which way I rearranged these things I could not do it*. Melinda was hindered in her efforts by indecision and reports *...making about half a dozen attempts at this program and changed it each time*: Melinda was in a state of confusion prior to learning breakthrough because she admits *...I am very orderly. I love to do things in sequence. I hate doing things and leaving holes and having to leave things and go back. I'm determined that if I'm going to do something like that I do it straight through or not at all*. From Melinda's report everything was not as she preferred, it was disorderly causing confusion, which, in turn, was seen to cause frustration. The problems are seen to create the barrier through which she broke.

Melinda reports coming to a point prior to learning breakthrough where the frustrations became unbearable and she hoped the program would be finished. She describes a strategy as *...forget it...* and *...walk away...*. She goes on to say that the situation with her emotion was like *...the plateau stage...* where she had reached a block and had no where else to go.

Her explanation is that she *...found that (forgetting it) is always effective with me when I reach that block, that point, that plateau stage, I am better off walking away.* Her strategy in response, while unsuccessful earlier, eventually provided the learning situation in which she collected the information needed - overcoming one problem to concentrate on the other, a coherent program of events. While the strategy did not provide the desired program initially, it created a learning situation seen here as an atmosphere in which to relax into the writing task, and learning breakthrough. Melinda reports: *...I've got to be totally relaxed to be at my most receptive because if you don't have the right frame of mind it doesn't happen. You just keep hitting this barrier.* She went on to reveal that she had experienced breakthroughs at other times when in relaxed moods - *(sometimes breakthroughs come when I am totally relaxed).* What also emerges here in Melinda's explanation is a characteristic of this adult learner to know her own learning habits and to apply them to advantage in new situations - an illustration of how one might provide the conditions for learning.

Melinda refers to an intuitive ability which suggests, to the researcher, another characteristic possessed and brought to the learning breakthrough situation. Melinda particularly wanted known that she *...functions best when she leaves something until the last minute and then it has to be a spontaneous thing and I think: 'All right I've got to do this, I've got no choice, it's got to be ready by tomorrow etc and get on with it'.* That is when I produce the best results - under pressure. The pressure was caused by a missing link between what she had as material for the program and how to sequence the material. Whenever she made a deliberate attempt to find some sense in the order of the material nothing came in the way of ideas. She had to rely on her own intuition. She describes intuition as *...that innate sense that that belongs.* It may be said that it was cognitive - the activity was with the mind. However, there is evidence of a feeling for knowing - an affective dimension because she reacted to impulse. She says *...before I knew it I had finished the first part.*

Her learning breakthrough occurred in solitude, no other human was present. Included, however, was a typewriter and *...this piece of paper with all the things that I had scribbled out when I was at Mums.* Two learning aids are identified - typewriter and notes. These tools in the learning situation help explain the context in which Melinda was stimulated to access verbal information from memory.

Type of Learning

The type of learning seen to occur was developing a complex higher-order rule and from what Melinda says about *...the sense of it being a creative thing which I love*, it also indicates problem solving.

In addition, she used and learnt in her learning breakthrough lower order intellectual skills as defined in the conceptual framework and explained as follows. These skills help explain various types of externally directed learning involved before and during the experience which are: concrete concepts, defined concepts and rules. They were externally directed because they were demonstrated.

Before learning breakthrough there were concrete concepts, such as dancers, music, dance steps, and stage. Next there were defined concepts categorising the thing concepts to contextualise incoherent pieces of information into a schema which Melinda could apply. Melinda reports: *...impressions of visualising who could cope with a bit of reshuffling...I have worked with these people for long enough to know what they are capable of doing and it comes back to these mental pictures all the time where you know...you can see that in your mind*. She goes on to report, firstly, applying rules of relationship between the various concepts to predict an outcome and says *...you just get that innate sense that that belongs...before I knew it I had finished the first part of the program on the one sheet and was changing paper*.

The second rule was contiguity to create the sequence and timing of the performance. Melinda reports as follows:

I sat down to piece a program together and I had notes all over the place, pages and things everywhere. I know how I wanted it to look, but, then of course you've got limitations of your environment, the talent that is at hand, the technical facilities that are available and you've got to work within that framework. It seemed like: no matter which way I rearranged these things I could not do it. However, about a week ago it all just fell into place. Now I've got the program all done and it is all finalised and it is simply a matter of making up the routines and teaching.

What is noted from her report is order and timing.

As the formation of various learning outcomes emerge it is seen how she assisted externally directed intellectual skills with internal cognitive strategies. Melinda reports that it *...all began to fall into place...the minute that I started to type*. There is evidence of a response to the typewriter to

help recall. Interpreted from what she says, Melinda is seen to describe a tactile response of touch. This process is kinaesthetic, and is seen as the way she accessed or stimulated functions of memory. Kinaesthetics, however, does not in itself account for the program or its ordered sequence from an internal cognitive aspect, that is, *...all fell into place*. Recall and kinaesthetics are methods adults use to remember, but, not necessarily the function of cognition which established order for thinking about coherency. From what Melinda says the act of typing may have assisted the internal processes of memory, but what function of memory?. Melinda describes *...the sixth sense technically is the primary thing with me. That is what I go by: what will look good on stage, what will come across well, what will have audience appeal*.

Interpreted at the moment of learning breakthrough is an internal process or cue, a cognitive strategy to discern in this new way and analyse linkable concrete concepts of music and, the other, dance. She says *...visual impression...* to illustrate how the concepts or verbal information was expressed in memory. It is on these visual impressions that the researcher sees Melinda basing her connection of ideas, through the new use of a cognitive strategy. Melinda discerning these concepts was manipulation of her thoughts, the cognitive strategy seen here as Melinda's learning breakthrough. Melinda continued by implying that the next learning was *...the innate ability to relate music to dance*, which is, (interpreted), the application of a rule. She goes on to say *...It is not until I have got the body of the show when I stopped and thought: "Who could do this?". That is where it got to the secondary impressions of visualising who could cope with a bit of reshuffling*. A pattern emerges from what she says. It was here that one can argue she created the higher-order rule on the basis of combining other rules and defined and concrete concepts. To bring about insight, the higher-order rule was created to reach a solution to the problem between the incoherent material and what she needed to write as the program.

To explain the types of learning associated with producing the program, typing was a fine motor skill used in the experience and making a hard copy of her ideas was a communicative skill to declare verbal information.

Learnt as a result of learning breakthrough, was a new intellectual skill now used to conceptualise other similar theatrical circumstances in which her dance troupe work. Where before she struggled with *...limitations of your environment, the talent that is at hand, the technical facilities that*

are available and you've got to work within that framework... she now analyses the circumstances through the newly created rule which is seen here as semantics, but intuitive as far as Melinda is concerned, or as she says *...sixth sense*, and goes on to say that *...a good choreographer listens to what the music is saying...* conveying that she has an innate ability to understand the meaning of what is communicated choreographically in music and dance.

Experience of Breakthrough

Melinda's experience of learning breakthrough was suddenly finding that she was able to complete the design of the program. She says in relation to this and other similar experiences...*where suddenly you think to yourself: 'That's it! that is what it was meant to be.' It appeared as if by magic it suddenly falls into place.*

To help in this sudden re-organisation of knowledge was a tactile process experience, information processing in this study. Melinda says *...I went straight to the table, sat down and put a piece of paper into the typewriter...I had all my little pieces of paper spread all over the place including the floor...the minute that I started to type, it all fell into place.* Regarding that she says:

I am very much tactile...I'm a person that while I am thinking...I am an active person I don't like to sit and passively think...So that is where it comes back to when I sat down and rattled away madly at the typewriter because I was producing some results...Probably [felt] negatively, but, I started typing when suddenly it all began to fall into place. Before I knew it I had finished the first part of the program on the one sheet and was changing paper.

The penultimate stage of her experience was the touch of the keys on the typewriter. This reported kinaesthetic process experience is seen as her way of accessing memory, and the last act just prior to her learning breakthrough.

She identifies a preference for learning, experiencing her breakthrough in an exclusive way. She goes on to report *...sixth sense...* as another aspect of the way she likes to discern and this is reflected in the experience of learning breakthrough by the spontaneous way she reports experiencing creativity. Two aspects of experience are labelled in the study as 'Encounter', that is, exclusive and spontaneous.

Melinda explains that the moment she sat down to start work, she felt *...grumpy, because I was envisaging the problems anticipating them before they happened*. Having failed once to write the program, as explained above, a breakthrough during that Sunday morning was not expected. It can be presumed from her report that she expected to eventually write the program as long as she kept trying and used the strategy used in the past of putting problems aside, but, learning breakthrough to provide such ease for understanding the context and solving the problems of sequence was not predicted.

Through her saying that *...it all fell into place*, the researcher believes that a pattern was perceived within the unconnected pieces of information that she had brought to the experience. Presumed here was a 'Gestalt' form of problem solving encounter to explain the experience of making order from incoherent material.

Learning breakthrough was pleasurable. She reports: *I could feel my mood lifting*. It is appropriate to say, that an impact of the learning breakthrough was positive and pleasurable particularly when she overcome the problem of having to complete a written program to meet a deadline. This too may reinforce the occasion as a memorable event.

From what Melinda says about *...I don't know, some funny little thing that is back here in my head that when you here that music you know that the sort of dance you want to do is going to fit to that music*, a schema, before breakthrough, developed in which to think about music and dance to explain the process experience of selecting this material. The music and dance is seen as a part of the event because it represents the verbal information used in formulating the program. This experience of information processing may also involve the selection of previously learnt cognitive strategies seen to occur and reported in the types of learning. These strategies and the verbal information are seen to be brought to the breakthrough as an attribute of the learner.

A transformation is seen in the way she now displays self-assurance. She feels more self-actualised, brought about through appropriating the success which learning breakthrough provided and the increases in confidence as a result. She comments *...as a result we are on stage in a weeks time...there was something there to show for all the time spent*.

In addition, to draw on her words to identify a change, she commented during her interview that *...a good choreographer listens to what the music is saying and a bad choreographer simply makes sure that the steps fit into the time with the music. There is a lot of learning involved there.* Her intuitive talent influenced by this latest experience of success could provide a new perceptual consciousness for solving similar problems in the future. While it may also be argued that this has not happened, Melinda showed the potential for it to happen. It can then be argued that she had appropriated the learning to become more intuitive, a personal transformation of Melinda's talents for choreography.

Neil

Neil was, at the time of his interview, between 30 and 35 years of age. He is a dentist by profession and a business man, who, early in 1992 became involved in setting up an enterprise selling Amway products. As a consequence of training for Amway, Neil experienced a change in attitude described by him as *...a breakthrough in personal development.*

There was an ulterior motive - pursuing Amway as a means to making money. Neil disclosed that he was becoming dissatisfied with the present situation and the potential of it to continue into the future. Neil says the venture was *...an awakening of the fact that one should not lose sight of the future.* He revealed his desire to find a diversionary interest to dentistry because, *...at one stage, he said, ...I was losing interest.*

Amway is a mail order company selling products from a catalogue which is a business evidently requiring people with sales skill to promote, sell and distribute goods. Neil describes himself as having, before breakthrough, a melancholy trait, (introvert or a meticulous thinker) which was not appropriate for Amway's desired outgoing trait. Neil found talking to people with whom he was unfamiliar quite stressful and avoided such contact expressing his feeling as having *'...diarrhoea' over it, I would get upset. Talking, he says, was when I was out of my comfort zone.*

Both he and his wife helped each other during the process of learning the Amway business and selling as a skill.

Neil's breakthrough was learning to speak comfortably with strangers through which he became more self-confident and outgoing.

There was evidence of Neil's more outward personality observed from the interview. It was noticeable that Neil felt at ease talking with the researcher who was unfamiliar to him in such circumstances.

His learning breakthrough experience happened sometime early in 1992. The interview took place 23 March 1993, a lapse of one year between his breakthrough experience and having to recall the details of it.

The situation which led to his breakthrough was a casual meeting with a motel manager while holidaying and travelling through Armidale, New South Wales.

Context of Breakthrough

The context in which Neil experienced learning breakthrough was casual, but apprehensively uncomfortable. He was in a conversation with the motel manager. The learning situation was informal and located in a motel office. This was the particular learning environment chosen by Neil to experiment with talking to strangers.

The unfamiliar atmosphere in this informal situation was uncomfortable for Neil because he says he *...usually pushes Tina (wife) into talking with the people and paying the bill, but this time I did it...* and reveals he *...was not comfortable...* and that, he says, was *...the problem*. However, the point is it was a situation which presented Neil with an opportunity to trial talking with a stranger, and, as it turned out experience his learning breakthrough. Neil reports: *...I decided to go in with the point of talking with the fellow*. Neil also explains that *...the whole problem with my breakthrough was where I had to get through the barrier of being uncomfortable*. The context of breakthrough was apparently conducive to learning because it provided, remembering that Neil possessed a melancholy trait, a non-threatening practical action learning situation.

There was no teacher present, the social situation was interpersonal between two people with a mutual interest in conversing because they talked about personal things voluntarily.

For example, Neil says the motel manager *...told (him) that his brother owned a pub in Rockhampton and was 'flooded' out.*

Neil had learnt sales techniques prior to the breakthrough. He reports having read books. He says *...the change in me was due to that book and a combination of everything. It showed me that my personality was 'melancholy'.* He goes on to report *...listening to the tapes in the car (and) ...going to a few Amway meetings and seeing and meeting other people who were in Amway.* By previously learning about sales through *...starting off at a low level in the business and you work your way up. You ring people up and say to them: "Do you want to look at a business?" and that sort of stuff. You are talking to people that you don't really know so you must polish up your speaking skills.* Neil demonstrated how he brought a level of competence to the learning breakthrough experience which is seen here as a characteristic of adult learners.

There was evidence of a motive driving Neil because potentially he thought: *'Why am I doing this to myself?'. When really I do enjoy dentistry.* The motive was being drawn *...because of the business of selling Amway.* He goes on to reveal that he and his wife *...think about houses a lot. Homes seem to be our big motivation - what we can do with the house and how we can renovate the house etc. So I think we were thinking about that as well.* The drive, expressed by Neil as *...he who dares wins,* describes a motivational characteristic of this adult learner, and in response to this and what he said earlier about a diversionary interest, Neil was motivated to learn for personal reasons. Presumably, he was encouraged to keep going until, as he conveys, he had realised his goal to be an effective Amway sales person. Instead, as it turned out, he found an ease with which to talk to strangers and transferred the new skill to dentistry.

Interpreted, the characteristics described above explain how Neil was ready to learn. He had prior knowledge and skill, the attitude of determination to succeed, and the ability to recognise an appropriate situation in which to learn.

Type of Learning

Neil's breakthrough is interpreted as attitudinal because it is a change in his self-confidence. What Neil reports is *...talking was when I was out of my comfort zone and that was my breakthrough*. With reference to the conceptual framework, Neil learnt an attitude believing in his ability to talk comfortably with people. With this belief he now *...talks more to people*. Neil's goes on by saying:

What I do now is to talk to the patients just before giving them an injection. It tends to calm them. The best line is: "How have you been?" they seem to respond with a warm "he cares". In that, talking has helped me cope with the business of dealing with patients. The patients have become noticeably more responsive to the treatment and their time in the chair.

Demonstrated is his new outgoing and confident approach to people.

During the learning breakthrough experience he became conscious of a change in attitude. The type of learning, representing a cognitive strategy used to become conscious of change, is seen as recognition. As an outcome central to learning breakthrough, the recognising of change happened in a new way. Neil recognised for the first time a personality shift - he was more outgoing as Neil explains, he *...took control of (his) melancholy traits*. As a consequence he is then seen to further recognise the positive response from the motel manager to his own approach. Referring to the time in the motel office, Neil reports that *...I was trying speaking skills*, and discovered, to his delight, that *...(speaking generally without recourse) worked and it just kind of fell into place*. Neil reflects that he *...got a whole lot of information in a matter of five minutes and began talking for quite a while...the exercise of talk was to see if it would work - it did*. Cognitivity is the internal step or steps in Neil's learning breakthrough and identified as the occurrence itself before realising self-confidence.

Neil had all of the other necessary learning to experience learning breakthrough as it is now explained. Neil reports that he already had the skills except being self-confident. With regard to previous learning, he gained knowledge from reading books and listening to tapes, verbal information in terms of types of learning. He also practised talking to strangers about joining Amway to establish some means for gaining a rapport with people when conversing on matters of Amway business.

He knew how to manipulate his thoughts through recognition of relevant verbal information, an intellectual skill of discrimination.

What Neil gained from the experience was conversing with people, a communicative skill to interact with strangers. Neil discovered, through conversation, that he became aware of people wanting to talk and how, through it, he could learn about them and their interests. Neil shared some of his findings - he suggested that people will *...even tell you what is in their bank balance, if you were that cheeky*. Through having the knowledge of personalities from reading books on the subject prior to the learning breakthrough and the response at Armidale, his learning breakthrough, Neil was able to exploit as never before his knowledge through self-confidence and his prior developed communicative skills. He explains that *...I could start talking to people and I found that they started talking to me...if you talk to people for a while you can sort of work out their personality and then know what not to say*. Neil says he learnt *...the skill of being able to talk to people*.

Experience of Breakthrough

The experience of breakthrough was personal. Firstly, because Neil says, *...to me (breakthrough) is completely different (from other learning experiences). It is coming from within me...It is not for outside scrutiny...I make the decision if it is right or not*. Secondly, learning breakthrough was personal because it concerned his personality - pensive or melancholy trait. He explains that *...I found that I was not comfortable. I become comfortable after a little while, but not initially...Talking was when I was out of my comfort zone and that was my breakthrough*. Neil identifies learning breakthrough as *...going outside my comfort zone, it was what I had to do to be successful in talking to people*. His encounter with learning breakthrough was a release from his dominant melancholy trait, the impact of which produced more confidence in talking with strangers.

He goes on to explain *...the whole problem with my breakthrough was where I had to get through the barrier of being uncomfortable... to reveal that the learning breakthrough lifted a barrier, a eureka experience*.

The learning breakthrough was pleasurable. Neil reports it *...made me feel good...* and goes on to identify another impact of his experience where

he says *...it changed my whole outlook on life (which is demonstrated through) my attitude to people, dentistry and to life generally.* He also comments that *...I am more motivated. If I say I'll do something I'll do it more so now than I would have before.* This is a change in behaviour.

It may be argued that his learning situation was planned, but learning breakthrough was not expected from what Neil said earlier about not being comfortable in such circumstances and expecting similar feelings in this meeting, unsuspectedly, he says *...The exercise of talk was to see if it would work - it did.... and ...I become comfortable.*

The impact, Neil reports, was a release to feel competent talking to strangers with ease and to realise *...that it had changed me in a way and I thought: 'Oh! I'm talking more to the patients'. I felt more at ease with my work as well as talking with people...I felt after my breakthrough the kick to keep going.* He goes on to say that the experience was *...a big turning point,* suggesting a personal change to become more outgoing.

The information process experience is centred around his development prior to breakthrough and the verbal information which he brought to the experience. Neil read books and listened to tapes which is seen as apprehending the information needed for change. In addition, he practised, interpreted here as association learning, learning by trial and error. These processes of selecting cognitive strategies and the collection of verbal information Neil used to understand the complexities of interpersonal communication are information processes which formed the broader experience of learning breakthrough not seen just at the event itself.

The realisation of change is seen in Neil's report to take a short time over the period of the conversation with the manager to sense being comfortable and sense the ease for talking. Therefore, learning breakthrough is interpreted as occurring relatively suddenly, sometime during the course of his conversation or at a point in the conversation.

The transformation was Neil assimilating the communicative skill of speaking comfortably with strangers and that he *...can now tell when people are getting uneasy. You seem to tell by intuition.* This is explained through the conceptual framework as a new meaning perspective seen specifically in the way Neil eludes to a new awareness to understand, himself, people's

personality, and how they may or may not react as he speaks with them. The change here is permanent, appropriated as part of this adult learner.

In what Neil says about being more self-assured: *I am more of a reality type of person and want to do things rather than just knowing about them*, was his way of conveying his transformed personality. He now has *...staff meetings...*, talks more with his staff and he goes on to say: *If I say I'll do something I'll do it more so now than I would have before...* which was a new assertiveness and confidence transformed from introverted behaviour which he describes before learning breakthrough as being a thinker not a doer. It can be seen that Neil has appropriated to himself what he learnt and transferred it into life's roles.

In summary, Neil had developed the necessary skill before breakthrough. He sought and found an opportunity to trial the skill to apply it in a realistic situation. He overcame his negative emotions at learning breakthrough and, finally, built on that the communicative skill to be more apt to talk with strangers.

Norm

At the time of his learning breakthrough, Norm was a technical teacher of fitting and turning subjects employed by the Queensland Department of Technical and Further Education (TAFE), and located at the Maryborough College. In addition to his teaching, he was the college's appointed safety officer. Norm, at the time of his interview, was between 55 and 60 years of age.

Norm responded to the question; "Have you ever experienced a learning breakthrough?", by relating a series of events experienced at a professional development seminar and identified one event as his description of a learning breakthrough. The seminar concerned with risk management, held early in 1992, was part of Norm's work commitment. His motives for attending the seminar are seen from the following: *I looked at (the task at the seminar) as being part and parcel of the safety requirements of the college. What I wanted to do was to add to my experience of safety which was the risk and how to actually cope with that to lessen illness, accident, and so on.*

To attend the seminar, Norm had to travel from his home town of Maryborough to a pre-arranged venue in Brisbane. He was accommodated for four nights in a motel as were other regional seminar delegates.

The interview to enquire about his learning breakthrough was conducted on the 22 February 1993, a period of approximately one year after his learning breakthrough experience. He remembered events in detail and when asked to recall his experience at another time he provided the same information almost verbatim.

Norm's breakthrough was learning to understand what he read and what was said at the seminar to provide a new application for insurance protection in a risk management system in a TAFE college. What Norm had apparently achieved through learning breakthrough was to restructure his understanding to accommodate new information.

The teaching during the initial part of the seminar was described by Norm as being *a waste of time and effort*. He goes on to say that most delegates *did not understand (the content)*. Norm says *after the session finished, (first day), when we got to speaking with each other (at the motel in the evening) it became apparent that we were all hiding and that we had not understood it*. What Norm reports here is insecurity to explain the background to the situations from which he had to break to achieve the learning required to function better in his duties as safety officer.

Context of Breakthrough

The context in which Norm experienced his learning breakthrough was cooperative support and where he was relaxed into the task of learning more about insurance.

Norm describes the venue and environment at the seminar as an adequate classroom not modern. From his report he was involved with an off-the-job vocational training activity where delegates were away from their place of work training in a non-formal colloquium.

With regards to the social situation, Norm reports teachers provided lectures at times and small group activities at other times. Peers were also part of the social context. The relationship between group members at the

time of Norm's learning breakthrough was described by him as collegial providing camaraderie that Norm felt was important to him as a learner. It made him want to be more involved in proceedings.

However, Norm pointed out that the tense atmosphere within the class of delegates on the first day played a role in the preparation for his learning breakthrough. It was this tenseness that changed when the group began to interact helping Norm relax. He reports that initially...*it wasn't a friendly relaxed sort of atmosphere where you are going to get the full benefit of a learning experience.* Norm's adverse reaction was indifference, a characteristic of this adult learner which held back learning. He admits *...I'm one of those persons, that, if I'm not getting the full benefit from something, I'll sit back and let it ride.* His attitude, he explains *...I suppose it verges on despondency.* Initially, there was a period of turn off. Norm did not participate. The situation within the class of delegates changed and so did Norm. Peer rapport helped that change. He reports the learning breakthrough context as participative and supportive, he says it was at *...a point where they could participate...* and concerning himself he says *...it relaxed me and the faster that you get to know people the faster people start to respond and interact together.* Learning breakthrough was reported occurring during this relaxed mood of the group where Norm says he became more *...receptive to what was going on.* He goes on to suggest *...that it was possibly the beginning where I could see that there was a purpose served in the previous session.*

The atmosphere associated with the place *...was not threatening and it did not worry him from the point of view of hindrance.* However, he reports a hindrance from inappropriate presentation - a negative influence of the teaching. About it Norm reflects *...(the content) was kept in wording that was understood by insurers not for people in general or for people in our situation. That is the thing that caused me the hardship as far as understanding was concerned.* Apart from the teaching influence, the context he explains here is about himself as a learner. It is his negativity prior to learning breakthrough and illustrates the emotional barrier from which he broke.

To further illustrate the emotional context, Norm is seen to change before his learning breakthrough. However, he chose to explain first the anxiety he felt which was caused by a number of external influences - one of which is described above. Another is where Norm came prepared having

knowledge of the subject. He says *...I've had experience with safety and health, that presented no problems and I could accept what was said in those areas because they had application.* In addition, a learning aid in the form of a pre-reading was sent in the mail before the seminar to provide background knowledge of the sort of concepts he was expected to understand at the seminar. The pre-reading gave Norm an expectancy, he explains *...you carry a picture in your own mind of what it is that you expect and hope to get.* However, what he expected he did not get. There was a tendency for the material presented on the first day to interfere with what was read and what he understood, causing confusion and frustration. The situation caused anxiety because, from a college responsibility point of view, Norm had to comprehend the material, but, what was occurring was the contrary. Anxiety here and a turn off, from what Norm explained earlier, combined were emotional ramifications from which Norm had to change to provide an affective situation conducive for learning. The change came prior to his learning breakthrough.

A more conducive context for learning breakthrough was associated with three contextual conditions. Learning breakthrough was not reported until the whole group, not just Norm, became at ease with one another. In addition, the level of content was pitched to their understanding and the presenters began to interact plus pitch their delivery at the level the delegates could understand, including Norm. Norm explains that the change was when: (a) *...(interaction assisted breakthrough) to the extent that the people themselves were starting to talk more freely...*, (b) *...because of the type of information that was given, I believe (learning breakthrough) came about because of the opportunity to respond at a level that was understood...(the presenters) brought it back into our areas of work and thinking...*, and (c) *(the group began) participating more and interacting more with the presenters and delegates.* The teachers influenced the learning situation through a changed approach while Norm - the delegates too - became influenced to where he/they felt more confident and apt to engage in the activities and content.

Norm reports his learning breakthrough occurring toward the latter end of the seminar and when breakthrough happened for him he reported it happening also for other delegates. He says *...(breakthrough) was a chain reaction right through the group. Once it started, answers were understood and within a matter of a short space of time the whole of the group was*

breaking through. It is presumed here that Norm was influenced by the same stimulus as other delegates. This group aspect of the learning breakthrough is unique to Norm's case. It may show how the preparation of the group through the presentation or camaraderie in common with the delegates or the internal influences within the learners themselves at the time had a measure of commonality.

Type of Learning

Norm's breakthrough was learning an intellectual skill, a defined concept to conceptualise insurance practices into a novel aspect of risk management. About forming a class of understanding, Norm says that:

...it wasn't until the risk side of it became apparent and how the insurance against risk was necessary that (insurance) really started to serve a purpose. Norm goes on to reflect that one particular element fitted and locked in and its dependence on another to get the overall picture on how risk management was to function from the administration side to the engineering side of things and the safety program of prevention.

What Norm seems to describe is the formation of a schema in which he could understand the concepts presented in the reading and the seminar.

From Norm's report, there were several internal processes learnt during his breakthrough. He explains that he *...could see the relevance...* and goes on to reveal that learning breakthrough manifested when *...the different subject matter came in and supported each other (and how he could accept what was said in those areas because they had application.* Interpreted are a number of instances of Norm using cognitive strategies and other types of learning outcomes which converge as internal process steps of learning breakthrough, central to the occurrence itself. The processes are explored individually as follows.

- (a) Seeing relevance is seen here as recognition of concepts - *the different subject matter.* There are two learning outcomes here, the first is a cognitive strategy used in a new way to recognise a difference, and the second, is new verbal information, presumably, labelling concepts not previously known about insurance - that is, *...subject matter.*
- (b) Distinguish a connecting concept - *came in and supported each other* - is presumed a synthesising process or a cognitive strategy distinguishing relations between concepts.

- (c) Discerning *...just how all those little disjointed bits that were associated with insurance could be applied back into the local colleges* is interpreted here as referring to a new cognitive strategy to comprehend what the relationship between concepts had in common with practical uses pertinent to Norm.
- (d) Norm goes on to say that *...(he could deal) with it more freely once I accepted it...*, not that he made a decision or that he referred to an attitudinal outcome which it may be, but, drawn from his report here, he discerned relevance. This was a cognitive strategy for deducing concepts in general terms of practicability to understand himself what he discerned.

The cognitive strategies central to the learning breakthrough used in this new way are seen to converge with each other and verbal information as the internal associated processes. The cognitive strategies are, in summary, recognition, distinction, comprehension and deduction/discernment.

The intellectual skills demonstrating Norm's competent use of a new understanding of insurance principle as they apply to risk management are: (a) discrimination being able to distinguish one concept from another, (b) concrete concepts identified with the way Norm can associate concepts, and (c) a defined concept to place the material into classes of practical use. In addition, as a further learnt outcome there was verbal information demonstrated when he articulated, at the seminar, the concepts and their classification. The intellectual skills and verbal information is the external projection of the internal processes described in the foregoing exploration of the cognitive strategies.

Experience of Breakthrough

Norm's experience of learning breakthrough was an ease for comprehending insurance principles, as well as what he read and heard. The impact of the learning breakthrough, Norm says was *...(the concept of insurance incorporated in risk management) started to make sense, I certainly started to understand what (the presenter) was trying to get across. Once that happened as an individual I was able to get definitely more confident in my ability to cope with it.* Norm goes on to say that the experience was one step in a broader process of learning. His explanation suggests an intent, he says *...as a learning experience it was just another 'mile stone' that had to be negotiated (and a step closer to understanding the*

whole). Norm's learning breakthrough was a deliberate learning endeavour and he expected to learn. However, he did not choose the timing nor the reaction of the group, that was unexpected. Norm reports as follows:

...it was over a number of things that came about. There were several types of things, it was a chain reaction right through the group. Once it started answers were understood and within a matter of a short space of time the whole of the group was breaking through.

Two aspects of his experience are presumed from this report. Firstly, that Norm's learning breakthrough occurred at a brief moment in the process of coming to grips with a new concept and, secondly, that he was not alone in breaking through which suggests to the researcher that his experience was not unique, but common to other delegates as well. The experience was more a classroom learning encounter as occurs often and observed by teachers of groups of students.

Processes which form part of the experience are seen in two areas of information processing. Firstly, it is seen through association learning where a stimulus-response reaction occurred between the stimulus of the non-verbal communication of the teacher and the accepting response by Norm. Secondly, the acceptance of information seen as encoding. In the first instance of non-verbal communication, Norm reports that *...to a certain extent the breakthrough came as much from the non-verbal as the discussion. By sitting back listening to what was being said as much as taking part in it.* Where, from past positive conditioning, Norm learnt to respond to mannerisms he transferred this skill into this learning breakthrough experience. The non-verbal communication was used to collect verbal information. Hearing and accepting information was another part and seen in experience terms as the processes of learning. The non-verbal communicative skill is seen as the registration of information and was not an outcome of learning breakthrough, but a way of experiencing the information sending communication at the seminar.

Another process experience is seen in the way Norm displayed an approving attitude, that was, Norm says; *...from guest speakers who were providing information with authority.* Norm provided his interpretation and says, to him, it was *...an approval mannerism...* Conveyed to the researcher was Norm's confidence in presenters. This confidence is seen to be played out by the way he experienced the acceptance of material, Norm says *...acceptance did occur.* It is also seen as an information process or encoding.

Part of the preparation for learning breakthrough, and process experience of the sort that concerns the person of the learner, is an attitude change. Norm implies that he needed to change to be positive before he could accept the information. He changed from a negative to a positive attitude with the effect of *...(then) dealing with information more freely.*

Apart from the impact on his ability to understand insurance, and the impact on feelings prior to learning breakthrough the experience itself had impacted on his emotion. He found in the short term *...as an individual I was able to get definitely more confident in my ability to cope,* and during a mock trial which followed to test the delegates and Norm's comprehension, he says he coped well with the pressures of performing before his peers *...with a fair amount of confidence. I knew that I had the support behind me. It was a sense of security.* The resulting long term feeling was one of growing self-assurance because, he says *...when you have to report on these sort of things when you go back to the college you want to feel adequate because you are expected to speak with a level of authority.* The emotion identified is confidence in understanding the concepts.

The transformation seen to occur is interpreted from what he reports about *...the more you understand a particular topic the better the chances are that you can grasp it and use it in an enlightened sense.* Interpreted is his appropriation of a new idea as a development of a meaning perspective - a new schema for applying his knowledge in future problem solving situations.

To capture the knowledge in order to transfer into the college situation what he had learnt at the seminar, Norm reports rehearsing. The experience of trialing the concepts in a mock trial set up by the seminar facilitators was a process to assist Norm's long term memory. He reports *...the trial was for us and what was expected of us as employers in relation to "Risk Management".* In terms of the study, this was an information processing method used to encode the knowledge gained out of learning breakthrough - part of the process experience after learning breakthrough when Norm found a need to confirm what he had learnt and how it was used in simulated practical situations.

Tina

Tina is now a 31 year old mother of three children who enjoys singing. At the time of her breakthrough 1, she was a primary school teacher.

Tina's breakthrough was learning to achieve a previously unachievable level of singing. One characteristic of this adult learner was that she could already sing. What eluded her was the ability to sing using her upper register.

The learning breakthrough 1 experience to use her upper register occurred in 1981 while taking singing lessons. Many classes occurred over a period lasting approximately eighteen months. The classes were usually conducted after work between 6.30 and 7.30 pm and to attend Tina would travel each evening from her place of work into the city of Brisbane. Her breakthrough occurred during one of these classes.

The interview where Tina volunteered to talk about her learning breakthrough was on 6 April 1993. There is something rather extraordinary about Tina's breakthrough which was also identified in the literature review. She, along with others who self-reported learning breakthroughs, remembered detail after a long period had elapsed from when she experienced the phenomenon to when she self-reported it, that is twelve years. To Tina, learning breakthrough was a special event to be remembered with such clarity.

Context of Breakthrough

The context in which Tina experienced her learning breakthrough is seen here as a barrier to a transition from singing in one range to singing in another much higher range. There is also a more complex context in which learning breakthrough was embedded. There were processes and skills already developed and a determination to succeed. At the same time Tina is seen to be dependent on her teacher for guidance and a program of pertinent preparatory activities.

The environment in which Tina experienced her breakthrough was at a music studio. She described as the environment a small twelve foot square room with minimal furnishings including a piano. The room was quiet with

no distractions, describing a pre-designed environment with an atmosphere where Tina could relax and which was conducive to learning a specific skill, singing.

The social situation was one person, Tina's teacher who was also her accompanist. There is seen a climate of discipline with the teacher's approach to training Tina because Tina reports *...standing, always standing hands in front. Standing by the piano next to the teacher.* In addition, the learning situation was non-formal because she was able to work at her own pace. However, as seen in the foregoing report there were some extremely formal strategies used in the teacher/learner transaction. The learning situation was apparently supportive of the rigour required for teaching singing.

Characteristics particularly possessed by this adult learner prior to breakthrough was knowledge of music, and an ability to sing in tune. She explains: *...what probably contributed to the breakthrough was all the knowledge up to that point then it just all fell together. I think perhaps that it almost happened accidentally. If I hadn't had all those lessons before hand it may not have happened.* Tina brought these capabilities to the learning breakthrough situation. She asserts that *...all the things that I had learnt to that point got me to that point and not stumbled on to it accidentally.*

Another characteristic which identifies Tina with adult learners is a challenge, she says *...I love to sing songs like 'Vilia' that go really high. Just the challenge of it. I just like doing it.* There was motivation to sing like trained singers who were apparently a model which she wanted to emulate. A motivation, she says, of *...wanting to aspire to the level of singing and sing in opera...singing is just something that I knew that I could do and do well. I am proud of my voice, and her drive to be ...a high achiever...* is seen to provide the determination evident here and with most of the other cases in the study.

With regards to breaking through, there is the inference of the existence of a hurdle or barrier. For Tina, this was not knowing how the curious sound was made. She did not *...know what (she) was to learn until after (she) had learnt it.* This was her barrier to be lifted at breakthrough. About curiosity she reports *...It seemed like...let me explain: I can't understand it when you look into a painting and it is like a mess. I can not comprehend what other people see in it. This seemed like the same thing.*

(The teacher) was telling me all these things and I just couldn't get what she meant until I did it then I realised what she meant. The nature of the barrier was that she could not find the right combination with her voice and without having a learning breakthrough to feel the experience for herself she could not clarify how the sound was formed in the throat - the elusive outcome she desired. The barrier took two forms. One she lacked understanding and, two, she could not perform what she could not understand.

Creating a context supportive of learning was seen partially in the way the teacher coached and encouraged Tina. In this situation the teacher was, according to Tina, very supportive, but, Tina had to do the singing herself.

A learning aid in the form of a piano provided the notes and accompaniment, and *...a whole lot of different exercises...and scales...* were other learning support mechanisms used in practise providing the means to strengthen and extend the range of her voice before learning breakthrough. Knowing the music, a strengthened voice and feeling *...comfortable and comfortable with the teacher...* from months of classes helped create the supportive learning situation apparently present at learning breakthrough. Combined, the environmental factors, the various learning situations, the social situation, the influence of the teacher, the learning aids, and the characteristics of this adult learner are seen here to form the supportive context for her learning breakthrough.

Type of Learning

Tina's breakthrough was learning a new fine motor skill of sound making to execute the *...change from the lower register to the higher register.* She goes on to explain she had *...experienced a physical breakthrough...you kind of actually push your tongue right down low onto the bottom of your throat and open up and have an 'O' shaped mouth but with a bit of a smile. That is how you do it.*

Identified from Tina's report are internally and externally directed processes and skills that combined to provide the outcome of singing in the upper register. By directed is meant processes projected to be internally experienced without observation or externally expressed to be observed or demonstrated. Two examples in Tina's case, explained in the following paragraph, are seen to occur at the point of her learning breakthrough, a

cognitive strategy (internally directed) and a fine motor skill (externally directed).

During the experience, Tina reports using her prior learnt cognitive strategies to manipulate her inner processes in a new way. One of these strategies occurred while watching the pianist's hands. Tina paid attention to subtle placement or movement of the hands up and down the piano scale. Tina says she remembers *...watching her (teacher's) hand on the piano keys waiting for her to go up a note*, inferring that she would anticipate the next note and prepare to sing accordingly. The cognitive strategy interpreted from what she says of making a connection between the expectation of a note and the corresponding thinking to interpret that note plus, in turn, to choose a skill to project it is a new way of using association. There seems to be a quick succession of cognitive strategies happening at the point of learning breakthrough. Firstly, she recognised a change in the conditions of the teacher's hands. Secondly, she distinguished a meaning for the change. Thirdly, she interpreted the change and, finally, she selected a skill. The result of this cognitive outcome is seen to produce a reflex reaction manifesting as a fine motor skill within her throat to reach upper register.

In addition, in harmonising her voice with the note from the piano *...(singing the 'E' above an) 'F' above middle 'C'...* she is seen to learn an intellectual skill and a communicative skill to master aspects of the sound relationships between her voice and the music. Intellectually she conceptualised the note from the piano to form an audible interpretation and the communicative skill provided the external expression of that intellectual skill.

Recognition of the skill occurred after breakthrough. Tina says *...I just did it - surprise surprise. The teacher then reacted with: 'That's right! now, that is what we have been talking about.'* *Then I knew...the moment may have passed unnoticed if it was not for the teacher highlighting the instance.* What Tina had done was use an intellectual skill of discrimination to distinguish between the old way and the new. However, what this skill achieved for her was reinforcement of the skill to encode it and make the skill, experience physically, an intellectual outcome. Simple, she understood her learning experience - the understanding which was notably part of her problem prior to the event.

Tina learnt other intellectual skills identified from the following comments: *Afterwards, when ever I heard anyone sing I could then say that that is the difference between someone who has learnt and someone who hasn't learnt singing...I knew then that I could do it like other people, and, ...it was very satisfying after I had done it for the first time, then I was right and I knew from then on.* She had (a) learnt a defined concept to classify instances where high register is used to its full advantage and (b) learnt a concrete concept to identify high register sound. As evidence of her knowledge of the way the sound is made she shares the following.

It is the vocal cords and your tongue and the way that you form your mouth. You kind of actually push your tongue right down low onto the bottom of your throat and open up and have an 'O' shaped mouth but with a bit of a smile. That is how you do it.

Her report demonstrates that Tina can now verbalise her conception of the innate skill she now has as a consequence of learning to use her upper register. It can be argued that she, using a cognitive strategy in a new way, associated a feeling with sound making before explaining the details of the feeling using a communicative skill.

Experience of Breakthrough

Tina experienced learning breakthrough as a sudden, unexpected freedom to reach notes never before achieved. She says *...to me being able to do that is almost the crux of singing more than being able to hold your breath.* She explains here an important juncture in her singing.

She goes on to say that *...I didn't know what the difference was until I had learnt it myself. I then said: 'Aha! that is it.'* In the encounter, Tina had discovered for herself a latent skill and it made her feel *...very good.* She says, considering what happened and comparing this experience with other like experiences in learning, *...('the release of so much scope for singing) has made it perhaps a more enjoyable breakthrough than others that (I) have had in the past.* What is seen explained is an extraordinary property of Tina's learning breakthrough experience.

In her experience of internal processes prior to the breakthrough Tina reports practising scales and exercises to reach a point where she was prepared. This and other preparatory learning functions formed part of

Tina's development towards her readiness for learning breakthrough. She says, when *...I could hear myself improving, ...that was its own reinforcement to keep going.* Along with the stimulus-response of the associations Tina made with the hands on the piano keys interpreted here as an operant condition and association learning they together form information processing - a process experience and information processing in terms of the conceptual framework.

The impact was confidence. In Tina's words she says *...finally, I'm not stupid I can now really relate to what she (the teacher) is saying.*

Tina reports a permanent change to her voice range and her standing in terms of voice types. Tina reports that: *I was always considered an alto and always thought of myself as an alto because I thought I couldn't sing high. I didn't know how to change my register so I would sing alto louder. After this breakthrough I realised that I was actually a soprano.* The transformation was her appropriation of a new voice range - from alto to soprano. The upper register is now automatically used at will. Tina's increased self-actualisation to move closer towards being an opera singer was a personal change. She now chooses to value herself as a singer.

Finally, she reports an information process experience where she engaged in thinking and reflecting on the movements in her throat and voice box which made the sound. As a process experience, not a learning outcome, she apprehended the understanding through reinforcing the skill. Reinforcement is seen as information processing. What Tina reports from the comments of the teacher who said to her after she broke through *...That's right! now, that is what we have been talking about.'* Then I knew, was the sort of reinforcement which provided feedback to establish her understanding.

Warren

Warren describes having had a reading and writing problem since school. He is now 35 to 40 years of age and when he experienced learning breakthrough he was enrolled as an adult in a literacy program at the local Technical and Further Education College.

Warren's inability to read and write was attributed to an unfortunate schooling and past association with people who could not or would not help. Warren explained that he was never diagnosed as incapable of learning, the contrary was the case. He felt himself that he was able to achieve at what ever he desired. As a testimony to that, he now works to help intellectually disadvantaged people gain skills to be more independent. He also writes reports on their progress. Warren asserted that *he now writes. I write stories and reports. I'm in there and doing it.*

His breakthrough was learning to write his own story. It would be inappropriate, though, from Warren's report to presume that the learning breakthrough experience was solely responsible for the long term effect on his writing ability. What is certain, however, is that an ability to write began with the creation of his story, his learning breakthrough

Context of Breakthrough

Warren's learning breakthrough occurred in a context of self-assurance with external learner support but with a barrier preventing progress.

The environment was a classroom at the local TAFE college. It was where Warren could come during the day to be tutored one-on-one. The adult literacy program in which he was enrolled was a formal class concerned with developing basic reading and writing skills, and self-esteem. The program was formal because there was a set program, timetable, role, lectures, activities, and objectives. Socially, there was a teacher who conducted plenary sessions, and a 'face-to-face' tutor who also worked with Warren. Other students were part of the social context. It was a supportive learning environment appropriate for learners, such as Warren.

The atmosphere of the learning situation is described by Warren as challenging, relaxed and enjoyable. Taking each of these elements separately, Warren reports the challenge as having *...a certain amount of work to get through.* As for relaxing he says *...basically the whole thing was at my own speed,* and for enjoyment, Warren reports *...we played games like scrabble and things like that which made it more fun.* Learning aids evident in his report included games.

In the context of Warren's breakthrough, he had a barrier to overcome. He was unsure *...that (reading and writing) could be done and that it wasn't out of (his) reach...reading and writing was just one of those barriers.*

Warren explains:

In third grade class I had nuns as teachers...they had this way of teaching that if you had more than three words spelt incorrectly they would cane you. One cane for every word spelt wrong. I couldn't pronounce the words let alone say or spell them. Well every Friday I lined up for seventeen cuts of the cane. I think I just took a hate to it. Truth be known, that is what happened and every time someone would ask me to spell something I would shudder and crawl into a corner.

For years it went on and finally I ended up admitting it to people as opposed to hiding it all the time. I would overcome my problem by having it written out before hand that is., a cheque written out in the wallet or something that would show me how to write out numbers.

What Warren describes is an inability to communicate, and reflecting on his role in his work life he says that *...it has been my main barrier all along. Every time I started a job with an employer and I could progress to a more responsible position it was just impossible for me...I have always stopped when it came down to writing about it or to give details about it or even reading up on it.* The characteristic Warren describes about himself as an adult learner is emotional and cognitive disability. In addition to having an inability to read and write, Warren identifies another barrier of feeling insecure meeting society's standards and ideals.

Warren being *...embarrassed about the fact that I couldn't make it with other people,* was on the edge of social isolation. *Other people,* he says, *treated me as if I was less than intelligent.* In addition, Warren infers that schooling to him had been fearful. He brought this emotion to the learning situation. In summary his feelings coming into the learning situation were of fear, anxiety and insecurity. He remembered, though, that the atmosphere at TAFE was positive and supportive, quite the opposite to what he expected. The atmosphere helped him develop an interest in the activities, learn and quell the fears of an expectation of more of the same negativity.

The influence of the teacher was particularly portrayed in the report as playing a dominant role prior to and during Warren's learning breakthrough experience. She was, he says, supportive and encouraging. A rapport developed which helped to change the way Warren felt about learning and himself. The teacher, he says *...always treated me like I was really clever, much brighter than I thought I was. Sylvia was always*

positive. She always fed me with positive thoughts which is incredibly encouraging. A characteristic of this adult learner seen to develop in class was a degree of self-confidence and self-esteem due to the teacher's approach to teaching. Warren says *...she was encouraging*, and goes on to explain that: *If you wrote down a word and you had one letter wrong she would say: "Yeah, but you've got five of them right." That was really encouraging. Sylvia (his teacher) had a hell-of-a-lot-of-want-to-teach or draw that something out of me that made me more interested.* Warren did not report any of his negative feelings at the time of his learning breakthrough. To the contrary, he reports that he enjoyed his involvement with the class and the learning activities, a characteristic of this adult learner which induced motivation and an expectancy of a positive outcome.

What Warren brought to the learning breakthrough was some ability to comprehend language. He reveals that *...(he had) always been able to comprehend what little I could read.* Experience is a characteristic of adult learners and one which helped Warren take advantage of opportunities in class to communicate to the teacher and other students about matters he understood. Warren explains that *...we did things like reading and writing and comprehension type exercises which were good because it made me read quicker and repeat what the story was about.* To be able to read, write and comprehend, Warren had to possess some skills to assist and provide a means for participating in class exercises - he had prior knowledge.

In Warren's words, as he approached the moment of his learning breakthrough, he was confident, he says *...confidence definitely (grew) that is true.* There was also a report of motivation described as *...self-drive, ...no longer deny that I was illiterate, and (inability to read and write) was something that (Warren) admitted to myself and wanted to (overcome).* Motivation and confidence were characteristics of this adult learner during the learning breakthrough event.

Type of Learning

Warren's breakthrough was learning a communicative skill to write a description of perceptions and images remembered from his own life experiences - his story. Warren had brought with him the ability to write as a motor skill. What Warren describes, as learning outcomes, are a number of

learning types, one of which is verbal information brought to the fore by a communicative skill. He says that *...when I could play with my own mind, I started writing and it felt good just to see things actually going on paper.* The way Warren brought this information forward into a written story is interpreted as follows from his report where he explains learning the structure of English.

In the learning of the communicative skill Warren reports cognitive strategies. He reports *...I started to find that the smaller words like the 'the', and the 'to', all those silly things fitted into place [like] 'to, too or two' was always 'to' (when sounded) no matter which 'to' it was.* He began to think differently about language structure through recognising word sounds and differences in words. Warren's report was that teachers *...would put out things in front of you and say: 'how many words can you get out of this and how many words can you get out of that.'* *Once I started to get the hang of the different sounds it became easy.* He quips *...Yeah! I'd say that that had heaps to do with it.* It is presumed from this that he learnt to use a cognitive strategy to comprehend verbal information.

To expand on the notion of comprehension, Warren says *...I would read it and then write what I had comprehended about what I had read...by reading the whole sentence.'* *and I then if you have a problem with a word [by coming back to it],...[he] found that the word worked itself out. That definitely worked.* He is seen to demonstrate an internal thought process to manipulate sentences in a way he could understand. So when he says *...When those funny words with the weird endings ('ous', 'ed' and so on) and the silent letters and I could hear those and the difference in the sounds and say: "Yeah! that's it." that would have been the big one. Yeah! I'm going to do it...* he is seen to relate one common factor of sounds of words to an uncommon factor of their place in a word or sentence making their meaning clear. The act of relating factors in this new way is seen as a cognitive strategy - an outcome of the learning breakthrough.

Further on in his report, Warren comments about the moment he perceived it all coming together *...when I mastered those silly words like the "ous" endings and those sorts of things. When they, all of a sudden, started to click into place.* Highlighting some of his phrases, they illustrate learning outcomes: *...fitting into place... ...the hang of... and ...click into place.* These three phrases provide glimpses of internal processes identified as cognitive strategies used by Warren to think about how to understand language, and

experience the self-expression produced after learning breakthrough. Whether he associated sound with words or discerned something never before realised, has not been confirmed, but his report reveals thinking strategies connecting elements of language, stringing words together in sentences and making meaning. This convergence of multiple cognitive strategies, identified as a process for comprehending the language, occurred at learning breakthrough.

Warren remembers that a change came when the teacher asked him to convey his thoughts. She instructed him: *Here is a topic, start writing about it.* The topic was to write his own story. The cognitive strategies identified above and presumed here as cognitive outcomes of association learning, occurred perhaps internally while externally Warren demonstrated as an outcome, the intellectual skill defined concept to characterise his life story. It is now presumed that Warren, after making the necessary associations, produced this intellectual skill to form his ideas about the life story, to in turn, demonstrate communicative skills to express it on paper. He then, from the report, demonstrated a motor skill to write.

Experience of Breakthrough

Warren experienced learning breakthrough as a sudden manifestation of a skill to convey his thoughts. Warren relates to...*suddenly somebody lifted something from me. It was a whole new way of expressing myself.* Learning breakthrough was, he reveals, also unexpected. He put it: *to make it work and see something down in front of me...a miracle..* As he points out *...with me it was just starting to write and putting (words) into meaningful things like writing stories.* He goes on to report that it was enjoyable. He says *...I started writing and it felt good just to see things actually going on paper.* When the barrier was lifted of not being able to convey his thoughts and write with meaning, the feeling was relief. Warren describes as an impact of learning breakthrough, *...a relief to know that it could be done and it was not out of my reach - (Yeah! I'm going to do it).*

Another impact of learning breakthrough was a release to write with ease *...(his) own writing opposed to copying down things, and as opposed to only writing sentences.* The release, he says was *...a feeling of achievement or freedom maybe.* He also spoke of *...a bigger vocabulary...* which is an

impact demonstrated through the new ease for spelling and using a dictionary.

As to literacy, Warren had learnt to discriminate between different words to differentiate word sounds and spelling as a process brought to the event. This was an intellectual skill learnt before breakthrough and, in addition, carried into the present because Warren says he now has *...enough know-how to look words up in a dictionary where before I had no idea*. In the analysis, more intellectual skills of a type seen here as concrete concepts become evident which resulted after learning breakthrough - a quality seen here identifying the information process experience of the event to use skills in a repetitive way to achieve desired outcomes. He says: *he learnt to identify words and appreciate their meaning and use in the English language*, and goes on to say that *they started, all of a sudden, to sink in where in the past they didn't*.

His process experience, leading up to the point of his learning breakthrough, can also be seen here as association learning where, internally, Warren reacted to a stimulus provided by his teacher, that is, *Here is a topic, start writing about it*. The impression from his comment immediately following, *...I could play with my own mind...*, was Warren's response to retrieve information from memory by some cognitive means but also to manipulate his ideas. This is information processing found in the report as part of his natural manipulative process to choose an appropriate strategy previously learnt and brought to the learning breakthrough event - not as seen earlier as outcomes of cognitive strategies developed through their use in a new way.

Warren has demonstrated how he is no longer excluded from normal life pursuits and activities. This is an impact of the breakthrough identified as normalisation into society, where previously society could not or would not accept a man who was unable to write or communicate.

Finally, he had appropriated the new skill to become a writer in his own right - internalising what he had learnt. He has changed the way he expresses himself from making cryptic notes to writing sentences and paragraphs strung together to express his thoughts, ideas, and values. He reports now *...writing reports which is something that I would never have taken on before*. The transformation is seen in the way he has become more self-actualised and is motivated to communicate his thoughts particularly

through writing...*now I work with reading and writing...I'm writing reports now.* He is seen to have appropriated the learning and transferred it to new life roles.

Reinforcement for Warren, from what he says about realising he could express his thoughts in writing, is evident and is, perhaps, a reason for his new self-esteem. Warren reports that *...(knowing he could express himself through written media) was a relief to know that it could be done and that it was not out of my reach.* In rehearsing the achievement of writing, it can be argued he proved to himself he could do it.

SUMMARY OF CHAPTER

This chapter has provided an exploration of the eight participants' perceptions of their own individual experience of learning breakthrough. This chapter has contributed to the study by providing the necessary background material on which to identify common features reported in the next chapter. These features, in turn, form a profile of the characteristics of the learning breakthrough phenomenon sought in the study to answer the question: "What is learning breakthrough?".