

CHAPTER 6

ACTION RESEARCH : Cycle 5 A - D : Designing the teacher cycles

Introduction

Chapters 1 and 3 outlined the rationale for using action research for the whole study, including the evaluation of the CILL Framework with teachers. Chapter 6 elaborates on how action research was used as the methodology for trialling the CILL model and Framework, to:

- determine how teachers used the CILL Framework; its perceived influence on their teaching and student learning; how they interpreted the role of ‘coach’;
- determine whether the three theoretical assumptions and ten pedagogic propositions underpinning the model and framework design were sustained in action;
- examine the effectiveness of the action research process and the reasons for changes to the framework recommended by participant teachers within the process;
- determine whether the constructivist learning design approaches supported the achievement of the broadly constructivist national curriculum objectives; the implications for emerging constructivist concerns about entry levels, transfer and assessment;
- suggest changes to and future development of the CILL Framework.

Designing Cycle 5

The evaluation was designed as four sub-cycles within the fifth major action research cycle, roughly corresponding to two cycles per term/ semester over one school year.

The first teacher cycle was designed to include two introductory sessions, with the researcher in the role of coach, introducing and explaining the CILL model and Framework, while teachers explored the framework and decided how to incorporate it into their teaching programmes. The second, third and fourth cycles examined the implementation of aspects of the framework within normal teaching programmes, each cycle designed to be progressively more tightly focused to facilitate deeper and more systematic ‘reflective conversations’.

The CILL Framework was used as a menu from which teachers selected components to focus aspects of their teaching and student learning. The emphasis, for the researcher, was in providing teachers with choice and flexibility. The Framework could be used to design teaching programmes, but it was not used for this in the research.

Selection of action research group

Information literacy learning is only one of many approaches to teaching and learning supported by the New Zealand curriculum. However, not all teachers share the same level of interest in it and not all teachers have the time or professional interest to commit to participating in a challenging, time consuming, self-reflective project. It was considered essential to identify teachers with interest and commitment. It was decided to advertise in a free educational magazine sent to all schools in the form of a short article entitled “Mad

enthusiasts wanted!” which described briefly the nature of the learning and the nature of teachers’ participation. Thirty responses were received. Respondents were sent further information. This was followed up by a phone call to answer questions and establish details (teaching level, experience, subject areas, interests).

Composition of the group

Nine applicants were accepted. Coincidentally, they covered a broad range of levels and specialisms, and geographic and socio-economic spread over both islands, urban and semi-rural. Four were primary teachers, one a teaching principal, one a deputy principal, one a graduate of one of the researcher’s courses (Diploma of Teacher-Librarianship). They covered a range of year levels. One teacher taught at intermediate (year 6,7 level). Three were secondary, one a head of department, one a teacher with library responsibility. All were experienced senior teachers. Two were tertiary, both at polytechnics, both involved in degree and non-degree programmes, one in computing and accounting and one in advertising and marketing. Neither tertiary participant was a trained teacher. One teacher had just returned to the classroom after several years of involvement in delivering Ministry teacher inservice curriculum contracts. One secondary teacher missed the first audioconference and decided after two audioconferences that he could not afford the time. None had met each other except the two secondary who, coincidentally, were from the same school (neither had known that the other had applied). None had met the researcher except the teacher who was the graduate of her course. The sex of the participating teachers was not seen to be relevant; in fact, three out of the remaining eight were men.

Essentially, participants represented a broad and differentiated group of New Zealand teachers. However, they could not be seen to be a typical group, demonstrating, in the experience of the researcher, a beyond average appreciation and experience of this type of learning. The experience of the group in this study is therefore not seen to be representative. It provided a unique and optimum situation for the purpose of gathering evidence on using the CILL framework for supporting and enhancing information literacy teaching and learning.

Identity of the teachers

In accordance with their wishes, and to acknowledge that the study was not a series of case studies on individual teachers, individual teachers are not identified either by initials or numbers. ‘T1, 2, 3’ refers to the first, second and third teacher to speak in any exchange rather than to ‘Teacher no. 1’.

Using audioconferencing made it possible to harness multiple perspectives and to generate rich negotiated meanings. The emphasis was on how the *group* responded to the framework and the process, not on individual teachers. While the researcher stressed the non-generalisable nature of action research, the data demonstrated that all teachers, to some extent began to respond on behalf of other teachers. They recognised that they were senior, experienced, and enthusiastic, and were clearly concerned that the researcher should understand that less experienced or more ‘traditional’ teachers might not respond in the same way.

Transcription became increasingly difficult as ‘shared meanings’ emerged and one teacher would begin a sentence while another finished it, and ‘threads’ would surface as fragments of conversation on the assumption that the others would remember the preceding conversations. They did, but it meant, for the researcher that ‘meaning’ only emerged when fragments were stitched together over several sessions. Coding and searching under NUD*IST nodes revealed more of these ongoing fragmented ‘narratives’.

The teachers' decision that they did not want to be identified individually meant that the researcher's original intention of producing individual teacher profiles was not viable. It could be argued that the composite nature of the text elicited in Cycle 5C, in particular, weakened the research process. In contrast it could also be argued, and the researcher came to see it this way, that it contributed a far more complex, richer and more authentic 'voice' than a more closely targeted audioconference process focused on research questions directed to individuals might have.

Ironically, the researcher's intention to use the individual audioconference cycle (5D) to elicit a more targeted individual response was interpreted by several of the teachers as a further opportunity to elaborate in even more depth on the particular aspects and experiences that they considered significant. To this end some came prepared with long written explanations and stories which sprang from, but did not necessarily relate directly to the focus questions circulated in advance. Again this meant a judgement call for the researcher, and a decision to honour the commitment and interpretation chosen by the teachers, rather than insisting on her narrower and more focused approach related to interpreting the CILL Framework in action. This may well be seen to represent and intrinsic weakness of the study, but in balance, the researcher concluded that the depth and quality of the data generated by the teachers justified the means.

Role of researcher in the action research process

The researcher adopted the role of coach in early meetings, familiarising teachers with the model, the framework and the 'props'. Each session began with the researcher in this role as coach, summarising threads from the previous meeting, or asking participants to draw a simple graphic to focus discussion. For example, one of the early changes that was made was to put 'learner' in the middle of the triangular model (so that the revised model now had *learner* at the centre, emphasising learner-centredness with the learner central to the three cornerstones 'narrative' - within the *context* of curriculum programmes the *coach* coaches the learner toward greater *control* of and responsibility for the learning).

Discussions in early meetings on how different levels of education provided a context for information literacy learning (summarised below) provided the focus for the group to gel as a learning group; to get to know each other and what they valued as teachers; to get to know each others' teaching situations and, each others' learners. A tangible feeling of cohesion and mutual support and trust evolved over the weeks; we were developing as a 'learning community', speaking the 'same language'. The use of expressions like "using prop 2 with my slow ones" immediately linked group members into the thread of that teacher's ongoing narrative.

After the first two sessions, it was possible to stand back from the role of coaching the understanding and use of the framework, and adopt the role in the group (given greater familiarity with the material through preparing the summaries and transcripts) of link-person in the narrative - the *narrateur* - making linking references to previous comments, drawing parallels and referring to emerging themes and recurrent issues in discussions. This role was maintained until several teachers reached the point of having completed a sequence of learning. The researcher then played a more active role, offering suggestions about focusing on one aspect of learning and related 'prop/s', and suggesting more detailed reflection on what strategies the teacher-as-coach used to enhance student learning. The group responded positively to this intervention, which narrowed and focused the nature of discussions more tightly in the second teacher cycle (5B).

Throughout the cycles, the researcher maintained this dual role of coaching and continuity; coaching the use of the framework, prompting deeper discussions and linking threads from previous discussions. While transcripts were fed back to teachers for confirmation, they found the brief summaries of issues and the inferences drawn by the researcher in this continuity role more useful. These provided a *de facto* agenda for the

next week's discussions. Participants also appreciated the effort made on one occasion by the researcher to group transcribed comments thematically rather than verbatim. The researcher made a point of emphasising the 'trial' nature of the CILL framework, and the fact that it was not a panacea and she was not expert in its use. While all participants took on board the challenge of learning to 'drive' it, the relationship with the researcher was not seen as that of expert-novice. The researcher was another 'learner driver' who had more expertise in the framework, but less than they at teaching in their diverse roles and situations. This was evidenced in the many and varied suggestions teachers made for improvements to the design of the framework.

As implied above, the researcher's role changed as the teachers themselves gained confidence with audioconferencing and with each other. The more understanding, trust, openness and respect grew between the participants and between the participants and the researcher, the harder it became for the researcher to maintain the *foreground* focus on the CILL Framework. Instead, increasingly, it became a *background* focus which the researcher initially saw as a weakness, but, in retrospect, as a vote of confidence in the integrity of the action research process within Cycle 5, and, consequently a major strength of the whole study.

Negotiating this role within the four sub-cycles of the applied action research was, at times, agonising for the researcher. On the one hand her experience as a teacher-educator suggested to her that she could design more direct interventions without compromising action research principles, but, on the other, she became increasingly reluctant to intervene in the growth of the *group* as a learning entity, participating in a learning process which, arguably, was richer and more varied through being constructed collectively through sharing narratives and opinions. The strong narrative threads which emerged became, in her opinion, one of the most valuable, though unintended benefits of the action research process and her decision to emphasise a continuity role rather than active interventionist in the process.

Data gathering

Meetings of the 'CILL group' were held weekly on Monday nights by audioconference during cycles 5A and 5B, fortnightly during Cycles 5C and 5D. Audioconference meetings were scheduled to last an hour, but usually lasted longer. Transcriptions were analysed and summarised on an ongoing basis (see below), and individual e-mail, written or phone responses and feedback were added to the data. In Cycle 5D individual semi-structured telephone interviews were held with each participant, and the same transcription, summary of key issues and verification/ clarification/ elaboration process was followed.

The first meeting of Teachers' Cycle 5A was an introduction to the CILL framework and project. The researcher introduced the Framework booklet (distributed in advance) and answered concerns that there would not be time to implement it 'fully' (Appendices 3 a, b and 4a). She stressed that the intention of the project was to integrate elements of the Framework into normal teaching as long as that teaching involved, in some way, the finding or/and transformation of information into knowledge. The first meeting of Teachers' Cycle 5C was, likewise, an introduction to the revised CILL booklet (Appendix 4b), with discussion as to how teachers might integrate it into current teaching programmes.

Cycle A and B provided particularly valuable data on the *context* cornerstone of the CILL model (Appendix 3a). In fact, most teachers spent nearly six months of discussing the pedagogic concepts in the framework, and the contextual (largely systemic) constraints - the 'what, why and why not'. In the second semester, they got to grips with 'how'. Cycles 5B and 5C focused to a greater extent on practical strategies for using the 'props'.

Analysis of data

The initial analysis of data gleaned from Teachers' Cycles 5A and 5B was an ongoing (manual) conceptual analysis of the verbatim transcripts. The framework for the conceptual analysis was the CILL model and framework - the three theoretical assumptions and the ten pedagogical propositions (Appendix 3b). The purpose was to identify key factors and issues related to:

- the use of the CILL Framework within the context of teaching programmes;
- the influence of the framework on teachers' teaching; and
- teachers' perceptions of improvements in students' constructivist information literacy learning.

These data were used as the basis for developing a qualitative unstructured data analysis protocol using NUD*IST software (see Appendix 5). The CILL theoretical assumptions and ten pedagogical propositions provided the underpinning structure for the analysis. This indexing protocol was used to re-analyse all the Teachers' Cycle 5A and 5B transcripts and to analyse transcripts from Cycles 5C and 5D. The evidence related to the three dimensions identified above is synthesised in Chapter 7, and the implications examined, with a more detailed analysis of the data in Chapter 8.

From these two levels of analysis, the manual and the computer-based analysis, it was possible to identify recurrent themes and issues. These were collated to form 'critical threads' which were analysed and related to the theoretical and pedagogical concepts underpinning constructivist approaches to information literacy learning. The implications of this third level of analysis constitute the theoretical and pedagogic insights derived from the study, and support recommendations for further pedagogical developments and research.

Veracity

After the meetings the researcher summarised the main discussion points and the inferences she had drawn from these in relation to information literacy learning and the use and development of the framework. Verbatim transcripts of the sessions, and these 'continuity' notes, were distributed to all group members for confirmation/ correction/ elaboration before the next meeting, and to provide an agenda to focus the next meeting. Several teachers chose to respond to these summaries, returning them with comments, suggestions and thoughts appended, or responded by phone or e-mail. These responses were incorporated as data.

In order to 'capture' some of the emerging threads, a lengthy summary was made after the fourth meeting, with a commentary of how emerging strands related to the researcher's views and agenda. This was done in the context of the researcher's role as coach of the CILL framework's theoretical and pedagogical base, and to make the researcher's role and thinking as explicit as possible, open to the scrutiny and questioning of participant teachers.

At the beginning of each meeting, participants were invited to respond to or elaborate on summarised themes, or issues raised in the transcripts, and to confirm that the researcher's inferences reflected individual and group thinking. Responses were hesitant and 'approval seeking' in the beginning, but, as confidence with the process grew, responses determined the agenda and rich discussion flowed with little input from the researcher.

Data were validated in several ways:

1. The data elicited from this process of transcribing, summarising and reflecting individually and as a group provided sufficient verified data for the design of the NUD*IST coding protocol (see above).
2. The researcher's account of Teacher Cycles 5A and 5B (half of Chapter 7 in draft form) was distributed to the participating teachers (with response sheets under the headings used in the chapter) for written responses if they chose. It also provided the agenda for the first meeting of Cycle 5C, and the opportunity to verify, as a group, that it reflected their responses accurately. The NUD*IST coding map was also distributed to participating teachers who were asked to consider whether it covered all the concepts and issues they felt had emerged in Cycles 5A and 5B.
3. Data from Teacher Cycles 5A and 5B together with Cycle 5C and 5D data were analysed using NUD*IST. This validated the researcher's initial manual conceptual analysis of Teacher Cycles 5A and 5B.
4. The first draft of Cycles 5A and B was sent to all teachers. Responses to the draft (in Chapter 7) of Teachers' Cycles A and B indicated that they were pleased with the synthesis. One teacher suggested that she would have felt uncomfortable reading her own words back "like the transcripts". All felt that it was an accurate representation of where we were 'at'.
5. Data from Teachers' Cycle interviews 5D (see Appendix 6) were transcribed and summarised and distributed to the individual teachers concerned for verification. Summaries of the eight transcripts were collated and distributed to the whole group for further discussion, verification and comment. Some teachers returned transcripts with annotations. These together with email responses were coded on NUD*IST.
6. Finally, in keeping with the nature of the whole study as action research, the insights and assumptions derived in Cycles 1 - 4 that informed the development of the CILL model and framework were related to the insights derived from the Teachers' Cycles using a question framework applied to systematic searches of the NUD*IST data (Chapter 8).

Designing the cycles

Teachers' Cycle A

The first teachers' action research cycle comprised ten meetings over three months. After the introductory session, teachers planned how they would integrate the use of the CILL framework into ongoing teaching programmes, and time was spent in the second session discussing their plans, together with what underpinned the concepts of control and coaching, particularly in relation to authentication and ownership of knowledge. Some teachers could see immediate areas of application, some had already embarked on a suitable topic and could use the framework to focus and refine what they were doing, and some chose to explore the ideas further before starting. At no stage was it intended, or seen desirable, that participating teachers should proceed lock-step, in tandem through the process. It was presented to them as a menu of propositions with a underlying sequence, but which offered options for supporting various aspects of information literacy learning.

As the sessions progressed, some teachers worked sequentially through the propositions. Others chose to focus on the model, and in particular on context, and the extent to which the educational context militated against this type of learning. Others were more interested in the role of the coach - how exactly students could be coached to learn in this way. As the sessions progressed, teachers used the framework, particularly the ten 'props' as a reference point for two things, 1) feedback on what they were doing with their students, progress, aspects of the framework which they had found particularly useful, and

problems they were encountering, and 2) for wide-ranging discussions on the education system, on the differences between primary, secondary and tertiary levels, on students' expectations of learning at these levels, and the rewards and challenges of implementing information literacy-type approaches at various levels.

Teachers' Cycle B

The first cycle defined its own conclusion as several teachers completed a learning sequence and moved on to other work. The researcher responded to their anxiety about undertaking another 'whole' information literacy learning sequence by suggesting that they do whatever they had planned, but use the framework and particular props to deepen their awareness of, and try to improve, a particular aspect of learning. This suggestion was readily accepted. One teacher, for example, chose to focus on questioning skills, an aspect of student learning she felt that the initial use of the framework had highlighted as deficient. The researcher also invited teachers, as part of their ongoing feedback, to consider their role as coach in the process, and what this meant for them. This re-focused discussion on the model and the relationship between what the coach did and how well students were able to gain control over their learning, learning how to learn.

As the second teacher cycle drew to a close at the end of the term/ semester, the teachers made suggestions for the process to be followed in the next cycle. It was decided to meet fortnightly, and to focus on strategies - strategies that the coach could use to coach this type of learning, and strategies that the student could be prompted to use in engaging in this kind of learning. There was consensus in some of the changes that they felt needed to be made to the CILL framework to make it more 'teacher-friendly'.

Changes to the CILL Framework after Teachers' Cycles A and B

Clear directions emerged for the pedagogy from the first two teacher cycles. Some were addressed by incorporating some of the teachers' suggestions in the revised Framework. However, the data also indicated the need to introduce a more systematic and precise exploration of three of the concepts that had emerged:

1. the concept of **co-directed learning**
2. the concept of **pro-active coaching**
3. the concept of **designing constructivist information literacy learning**

Incorporating these foci in the action research process allowed the teachers to go on using the framework however they wished in whatever programmes they were teaching. It provided the more specific strategies they sought, and used the three pedagogic assumptions to focus their awareness, their feedback and reflection more precisely. Teachers' responses were, therefore, incorporated in two ways in Cycles C and D:

1. in the design of a substantially revised version of the CILL Framework and booklet, and,
2. in suggesting a more systematic approach, a narrower focus, and more emphasis on pedagogic strategies.

In the revised CILL booklet (see Appendix 4b) the summary model was changed from a linear to a circular format, and the prompts for teachers were revised and added to in accordance with participants' recommendations. The new interrelated foci (*co-directed learning, proactive coaching/ reflective conversations, and designing learning/ front end loading preparation*) and 'Props' 9 and 10 were described in terms of scope, strategies and prompts, and seen as underpinning 'Props' 1 - 8. 'Props' 1-8 were then each expanded into a one page outline covering scope, possible prompts for teachers to use as guides, possible strategies related to these prompts, and possible thoughts that might determine students' learning responses.

The following explanations of the new foci were included in the revised CILL booklet:

Control: Represents the skills and strategies students need to take responsibility for, to *control*, this kind of learning. It includes learning skills that are cognitive, and the skills needed to manage and monitor their learning (for example, goal-setting, planning, managing time), and the skills needed to reflect on their learning product and process (metacognition and metalearning).

Co-directed learning: CILL is not self-directed learning. In CILL the teacher-as-coach and the student work together to co-direct the learning.

Teacher-as-coach: ‘Coach’ is used as a metaphor for a role-within-a-role in teaching. The CILL teacher-as-coach uses four main interrelated strategies: *Pro-active coaching*, *Reflective conversations*, *Front end loading* and *Designing learning*. These strategies are useful for *all* teaching, but they are seen as essential components of the CILL model.

Pro-active coaching: A lot of our normal teaching is reactive in that we get and give feedback AFTER students have done a learning activity. Pro-active coaching puts more emphasis on getting students to say what they are going to do, and how, BEFORE they do it. It provides the opportunity for the coach to do some modelling or direct teaching, and give advice BEFORE the learning, and to ensure that students can visualise and articulate the process they will follow during the next phase of their learning, and can negotiate criteria to describe what would represent a good learning product and process.

Reflective conversations: These are the technique the coach uses to get students to think about their learning *before* it has happened (see above), *during*, and *after*. Reflective conversations can also be with peers, self (through learning logs or diaries), software, or experts. They need to be designed into the learning because they are what promotes metacognition and metalearning - thinking about the WHAT, WHY and HOW of learning.

Designing learning and front end loading: This describes the idea that, in CILL, the planning and preparation are loaded at the front end! The more the CILL coach thinks through every dimension of the learning *in advance*, the better prepared they will be for coaching the learning. The CILL coach emphasises mental planning rather than ‘lesson plans’, using the whole context of learning (including curriculum requirements, knowledge of students, knowledge of resources) for *continuously* designing-in-the-head and monitoring the CILL LEARNING ENVIRONMENT.

Teachers’ Cycle C

Using the revamped framework, and focus on proactive coaching of learning strategies, this cycle explored strategies for implementing the ten propositions (Chapter 8). The definitions of the key concepts which had emerged in Cycles A and B (above) were explored by teachers in the context of increasingly lengthy narratives of actual classroom practice. The focus on practical strategies (emphasised by the researcher) had the effect of re-focusing the shared understanding of the problems and barriers to implementing information literacy learning in the context of emerging practice, with the result that a more positive focus emerged on problem-solving rather than problem-posing and sharing.

Teachers’ Cycle D

This comprised a cycle of individual phone interviews using a semi-structured interview protocol circulated in advance (Appendix 6). With permission a summary of the transcript

was circulated to all participating teachers so that all continued to build a shared knowledge base. The full transcript was sent to the teacher concerned for annotation and comment. This resulted in several ongoing email and phone conversations which all became data. As indicated above, teachers used the opportunity to comment on the focus questions in a variety of ways. Some added to their ongoing narratives of classroom practice. Some chose to revisit the problems which had emerged in the first two teacher cycles in terms of which strategies had provided positive solutions and which remained unresolved. Some used the trust that had developed with the researcher to discuss personal opinions, problems and situations. These conversations were regarded as personal and not treated as data, but they, nevertheless, consumed a significant amount of Cycle 5D time and were important in maintaining the action research process.

Emerging threads

Throughout the year ‘threads’ were fed back into the dialogue with the whole group in the form of questions to help the researcher confirm the veracity of her inferences. The individual interviews, while they were loosely structured, were also an opportunity to confirm and clarify some of the ideas particular teachers had raised over the year. Some teachers had put significant thought into the responses and had prepared notes. Others spoke from the heart on aspects that particularly interested them. In both cases the interviews were a form of ‘triangulation’, ratifying the accuracy and emotional veracity of the action research process.

As action research, it was research *with* teachers not *on* teachers. We all grew as teachers. We helped each other to grow in our understanding and *practice* of information literacy learning and teaching. The process was honest, rigorous, often uncompromising and painful, interspersed with moments of pure elation as teachers talked about something that had ‘clicked’ and we all rejoiced.

Where the contrast with Moore’s (1998) recent New Zealand study (Chapter 5) was most evident was how, as they iterated through the cycles, teachers’ own ability to describe the constraints to this type of learning, the planning, the monitoring, the strategies for coaching, the evaluation deepened, became more specific, better focused and evidence of what the researcher had hoped for - the use of the CILL framework for designing and teaching information literacy learning within a whole environment, a ‘knowledge construction environment’. Teachers used the framework as an orienting device for describing their teaching and students’ learning, and the changes they sought and sometimes achieved from *themselves* as well as their students.

The researcher has tried to show this in Chapters 7 and 8 by ‘letting the data speak’. It *did* speak, and the messages were often negative, confirming three decades of evidence about how challenging teachers and students find this type of learning. The fact that progress (in terms of understanding, ability to teach, and perceived improvement in student learning) was made in relation to all of the assumptions, and all of the prompts to some degree (although, obviously, not to the same degree) by all teachers signals that action research *with* teachers in itself represents one of the answers to the Kuhlthau/ Moore question, ‘But how do we teach the teachers?’ This process demonstrated the effectiveness of action research as a process for generating pedagogic knowledge.

Research parameters and methodological limitations

Action research is a process - a series of moving snapshots over time, not a still snapshot of one moment in time. The product is the process; hence its value in research which sets out with the express purpose of improving practice. However, the process of looking more closely at aspects of teaching and learning, benefiting from the observations and insights of fellow participants, and ‘reflective conversations’ with oneself and fellow participants over time, inevitably means that what one looks for, and what one observes, changes and deepens proportionately. There is evidence of precisely this in this process.

Teachers gradually became aware of what students *could* be doing, and how they could be guiding and coaching students *to learn* throughout the process. And as their awareness of the *cognitive* potential of each stage grew, so their criticism of existing student learning skills and behaviours intensified and became more finely honed. Likewise, their self-criticism and awareness of how much more *they* could be doing to assist student learning in their teacher-as-coach role grew and balanced perceived improvements in their students as well as themselves. To what extent this process of personal and professional growth was attributable to the CILL framework, the action research process, or having the opportunity to talk with colleagues in a 'safe' environment, is a moot point.

In the context of an action research study where the process *is* the product, the resolution to this dilemma is impossible and undesirable. The purpose of the study was not to establish the quality of the CILL Framework in any absolute sense, or measure the gains in student learning, or teachers' teaching - even if that had been possible. It was to allow teachers to improve their ability to teach, and students' ability to learn, using a constructivist approach to information literacy learning. In teachers' perceptions this was happening.

There was also evidence of teachers explicitly committing to, and enjoying, the concept of being 'a partner in learning' with students, and, within the group, with each other. For example, a primary teacher and his students together experimented and discovered that key facts from Encarta could be downloaded into a wordprocessing file, and re-shaped in the student's own words around key questions etc, which was "really enjoyed". Just as one tertiary teacher adapted the framework for his students, one primary teacher suggested a simple framework of prompts for students which was adopted by another primary teacher. It illustrates the blurring of teaching and learning processes, and the difficulty of 'teasing out' influences on teaching or learning, and attributing the cause to the use of the Framework.

T: Used X's simple framework - gave it to them. They found it really supported them and helped them clarify the ideas. Take out the words they don't understand at this level and give them words they are more familiar with. I think they found that really helpful. They are also changing what aspects they want to look at. Still some looking at compost; others looking at earthworms... really keen. They rang up and made an appointment with ... person with a worm farm; going to visit tomorrow.... taking responsibility for their own learning. Have to keep redefining the focus questions because they keep gathering all this info which isn't really relevant... Also key words... One group didn't have their key words defined so when they were looking for information they got quite frustrated. They couldn't find anything. What they found wasn't relevant, so we had a session with that group looking at key words and making key words quite simple, and the next session they looked for information and actually found it a lot easier. They felt quite successful with that... using coloured highlighters for information and then cut and paste and discard what they don't need... really feel that they are being supported and not frightened of taking risks with their learning... also looking at how to interview people 'cos that's the bit I thought they weren't too good on, especially with questions - a lot of them yes/no type questions. So we've had practices in groups using the two phone lines at the school, and that's gone really well. They've asked questions of an 'expert' who is one of their group members.

This extract from one group member's weekly feedback illustrates the 'full, messy life of a classroom' as context and the richness of the action research data that resulted from asking these teachers to take 'moving snapshots' of an evolving process. It also illustrates how difficult it is to describe 'teaching', and the multi-faceted role played by this teacher, who claimed not to have much previous experience with this type of learning and was using the framework systematically as a guide, but whose success with this group was, arguably, just as much attributable to and evidence of his being an experienced, 'open',

confident teacher whom the students liked and trusted. Similarly, is the fact that students are taking responsibility for their learning ('control'), applying the heuristic 'keys' (Prop 6) to 'interview' information directly attributable to this teacher's skilled use of the Framework, or a natural, inevitable learning response, given the positive and supportive learning climate that obviously already existed in his classroom?

The fact that, as explored above, teachers' stories increasingly focused around this full messy life of the classroom and less on the CILL Framework as such, had implications for the nature of the data generated, as did the composite nature of the teachers' responses, especially in Cycle 5C. This had the effect of minimising the differences between teachers, sectors and students' (in terms of abilities and needs).

It was both ironic and interesting that the teachers who spent the first two teacher cycles (5 A and B) exploring the systemic *differences* between primary, secondary and tertiary sectors in terms of how these differences contributed to the difficulty of teaching students to be information literate, spent the next four months (Cycle 5C) sharing stories, strategies, teaching experiences and advice, establishing that *similar* strategies could be implemented in different ways to solve some of the inherent problems they had identified. So, while the blurring of the boundaries between teachers and sectors could be seen as a limitation, it could also be seen as inadvertently generating some of the most positive pedagogical insights of the study.

Several comments need to be made in relation to the effects of the use of the CILL framework on student learning, as perceived by teachers. They apply, in fact, equally to any evidence pertaining to changes in teachers' teaching. Firstly, it is common sense to expect that focusing on or slowing down any aspect of teaching or learning is likely to lead to real and perceived 'Hawthorne effect' benefits. Secondly, seeking evidence of 'improvement' begs the question of improvement against what criteria or standards? Thirdly, the consequence of audioconferencing was the opportunity to peer tutor. Occasionally this reflected strategies related directly to the Framework. Often it did not, or did so only indirectly. For example, a primary teacher is making suggestions to a tertiary colleague:

T: About all you can do, I would say, is set them up and then, you know, half way down the track, stop, and say 'Let's share that. What have you found out in response to that particular question? Does it answer the question?... actually have a stop point where you talk and conference it through'.

If thinking analytically about teaching is a pre-condition for improving teaching, evidence abounds of teachers' enthusiasm for examining their own practices in the light of discussions focussed on the framework's assumptions and 'props', and for using other teachers' experience to consider strategies that they might not have contemplated otherwise.

CHAPTER 7

INFLUENCE OF CILL ON TEACHING AND LEARNING: Evidence from Teachers' Cycles (5 A and B)

The framework for the analysis of Cycle 5 data

In the researcher's experience, one of the defining characteristics of action research is the integrity of a process which builds cumulatively on shared understandings and interpretations of data, and the opportunity to recast the focus from 'research on' to 'research with'. However, when one applied research cycle is built into a wider framework of action research cycles, and when one participant's understanding is informed by far deeper theoretical and pedagogical understanding, as was the case with the researcher who has worked and studied in the field for twenty years, the parameters for this shared analysis of data must be pre-defined.

The researcher made the decision to adopt, as a framework for Cycle 5 shared analysis of data, the concepts and propositions which formed the CILL model and Framework. In other words, the framework for analysis of the teacher cycles was the same conceptual framework used to design the model and the framework, giving it an internal consistency. Also, as the concepts and propositions were explored with the participants and their findings related to earlier research findings, it put the researcher and teachers on a more equal interpretative footing.

Data analysis within Cycle 5 therefore, consciously, excludes the wider epistemological, theoretical and pedagogical perspectives brought to bear on it in Cycle 6 (Chapters 9 and 10). Using the three core concepts, context, control and coach (emphasised in Cycle 5 A, B), and the propositions (emphasised in Cycle 5 C, D), seemed to the researcher, to be an ethical response to the dilemma of analysing teacher-generated action research data in the context of a larger and much more broad-based study with epistemological, theoretical and pedagogic dimensions to which the teachers were not party.

Data from Teachers' Cycles were, therefore, analysed using a process of ongoing conceptual analysis, using the concepts that had emerged from the CILL model (context, control, coach) and the CILL Propositions. Verbatim transcripts, and summaries of issues and 'threads', were distributed to participants on a weekly basis and verified, either individually or at the next audioconference, as outlined in Chapter 6. In Cycle 5 A and B transcripts were analysed primarily:

1. for evidence of how the framework concepts (model and propositions) were perceived and used, and
2. for evidence of change in 3 respects:
 - changes needed to the design of the model and framework;
 - changes in teachers' teaching practice;
 - changes in their perceptions of how students were learning.

What characterised this phase was a focus which emerged naturally. It emphasised the teachers' evolving diagnostic use of the Framework to share insights into the problems experienced in the past of trying to translate the ideals of this type of teaching/ learning into classroom practice. The focus throughout this section is on 'letting the data speak', summarising the threads that emerged from teachers' discussions and reflecting shared analysis and understanding. The trends emerging from this stage of the research, outlined below, were later verified in the NUD*IST analysis tabulated in Appendix 2.

Diagnostic use of the framework

In the first teacher cycle, teachers focused on using the framework diagnostically, to establish and deepen personal knowledge and awareness of where students were 'at' with this sort of learning, and the constraints.

One teacher set out intentionally to exploit, sequentially and systematically, each phase and 'prop'. She was the course graduate who had had considerable experience, success and confidence in using the existing New Zealand information process framework. What her responses illustrated is another phenomenon that pertained to the whole research process; that the boundaries between teaching and learning blurred. In this instance, her teaching became all of our learning. She described a moderately disabled student whose efforts at applying his questions to 'reading' a picture and extracting all the relevant information were just as successful as the efforts of several very able but 'going-through-the-motions' learners who used a range of text resources. This became a benchmark for all of us. It raised other issues which became the focus for discussion in the group - the affective dimension of learning, the ownership of the learning, the relative nature of 'success'. Again, it was this teacher's description of how, studying the Masai, a topic which many would not have seen as immediately 'authentic' to New Zealand children, these students were so keen to find information that they scanned an adventure video set in Kenya, and spontaneously inferred answers to *their* questions. This prompted discussion about whether this fierce 'ownership' and commitment to knowledge for the sake of knowledge was achievable at higher levels in the school. Several primary teachers pointed out that it was *not* easy:

T: Can I just say that it's also awfully hard for primary school children to get into that way of thinking and learning, especially if they've come through and they're very dependent on the teacher for their knowledge and learning how to access information. It takes some time to change that thinking, and you actually have to wean them. You've got to keep going back and back and back to it until they're more comfortable and confident, and, I guess, more successful.

The parameters of the study, therefore, were determined as much by the teachers' decades of teaching and learning experience as by the Framework. We drew on a knowledge base as wide as their collective and cumulative experience. This ensured that the process was neither linear nor superficial. The strands that wove through the discussions were dense, rich, complex, varied and far-ranging. They were also difficult to disentangle and code in any way that would describe a clear growth path in teachers' teaching and their students' learning attributable to the use of the Framework. In earlier meetings, a lot of time was spent discussing constructivist approaches to information literacy learning, and similar problem-based approaches; what purposes and what students they suited. Different teachers had different perspectives:

T 1: I don't know that I agree that it's the BEST method; it's the IDEAL method, but not the best method for all students. I think it's a matter of maturity personally.

T 2: I don't think it's NOT appropriate until kids have a certain age and maturity or ability. I think very young children work this way, but I disagree with X. I don't actually believe it's a maturity thing or an ability thing. I think it's an approach we might select to use at certain times for certain children. Our less able children can use this approach and can work in a very learner-centred fashion as long as it's pitched at their level and they're using text/ pictures - and working with concepts THEY can understand... I think children like a variety of approaches.

T 1: I just think it also comes down to what's the most effective and efficient way of absorbing certain kinds of information... I have a theory that certain kinds of information, and I use times tables as a classic example, are much better learnt in a rote fashion... there are some things, tools maybe, that need to be acquired in a rote fashion, a memory basis (general agreement).

T 3: But it's not an approach you would want to use all the time because it's very intense. It takes a lot of one-on-one work with the children and I don't think you could keep that sort of impetus going the whole time.

T 4: At tertiary level a lot comes down to motivation. Did they choose to do the subject? Did they see any need for... was it a compulsory subject? And that completely influences the way they approach things, so even if you try and encourage, and set them up to learn to be independent, it's still 'What do I have to do to pass?'

Discussions of the parameters of CILL also covered the notion that this type of learning might be more appropriate for, and easier to achieve with, some learners than others:

T 1: Some kids seem to need that constant coaching, that constant being in touch, whereas other kids seem to revel in being able to run with their own ideas, and you get them going and they'll do extra work and they...

Another teacher comments:

T 2: And smaller classes are absolutely essential otherwise you can't get down to that individual time with each student to say 'how are you going, and do you understand, and have you thought about this?' It's the conditions again, isn't it (agreement), and conditions cost money. I'd like to see CILL model used in a primary school who are the major contributors to a secondary school and, you know, flow through... It needs to continue...

T 3: I don't think they can concentrate. A lot of them don't like reading. A lot of them don't seem prepared... they try things once or twice. If they don't get the answer they just walk away (agreement).

There was a recurring concern with time - a feeling of being under constant pressure and putting students under a pressure which was counter-productive to learning, and a recognition that this type of learning takes time to develop:

T: We're putting bricks on wet cement... not dry before the next lot's got to go on top... pretty wobbly and shaky because there's not that drying time or consolidation time... (general agreement).

Reluctance of some students to undertake this type of learning was a persistent theme throughout Teachers' Cycles 1 and 2. For example:

T 1: Although there are opportunities for them to respond in three or four places, many of them just don't... being analytical about their learning is going to take a lot more coaching than is currently the case. Rather than telling me about the learning that they did, I've learnt more about the learning that they need to do to evaluate themselves.

Another teacher comments:

T 2: ...hard for them to get the idea that THEY are responsible for their learning; it's not just something teachers do for students...

Socio-economic and cultural factors were also seen to impinge on the suitability of CILL-type learning, and the extent to which the curriculum learning methods were seen as recommendations, not prescriptions:

T: Teaching is an inherently subversive activity and we do what we flaming well like... when it all boils down. When I was teaching in Otara in Auckland, for example, I was a lot more, I think, an authority figure in that context, than I would feel comfortable with in my current one, just because of the cultural context I was in, and therefore I was more of a fount of all knowledge type, and that brings us back to X's point about the cultural context again. In some ways the expectations that the children and the community have of you... to a large extent the type of coach or the type of teacher you are going to become...

Another points out the difference between teaching in schools 'close to teachers' colleges', and dealing with the children of professionals, and the school she is at now:

T: They don't even live with Mum or Dad. I mean I have kids who come to school and I'll say 'Well, where's your homework, Teddy?' and he'll say 'Um, I slept at my sister's house last night, and I did my homework at my auntie's house the night before, and that's where my books are, Miss' (Lots of assent).

Evidence related to the understanding and use of the CILL model and the three CILL assumptions

Since the Framework elaborates a pedagogy from the three assumptions that form the cornerstones of the CILL model, evidence relating to the understanding and use of the assumptions has been summarised, interspersed with transcript excerpts. The NUD*IST re-analysis of the transcript (see Appendix 2) confirms and expands these observations.

There was consensus support for the idea of the learner at the centre of the triangular model, and an implicit assumption that education in New Zealand should be learner-centred, whatever that meant to individual teachers. There was, however, evidence of some conflict, at secondary and tertiary, between the self-directed, enquiry-type learning that these teachers were explicitly committed to because they saw it related 'lifelong learning', and the instrumental 'We're here to pass exams/ get a piece of paper' approach to learning (and expectation of the teacher's role) evidenced by many, even very able, students. This paradigm conflict has been explored below.

CONTEXT

The topic which dominated Cycle A discussions was the issue of context - the context provided for this sort of learning, and particularly the constraints (see Appendix 3a).

Constraints

Most constraints were seen as systemic. The nature of these constraints differed from sector to sector and tended to define each sector. As constraints were examined it was evident that teachers were beginning to understand, often for the first time, how sectors related in terms of similarities and differences. What emerged, however, was significant consensus on the constraints to this type of learning, particularly at secondary and tertiary level. These included: lack of time, overcrowded curricula, excessive content coverage required for exams, lack of resources, large classes, students at various ability and motivation levels, and students with varied levels of interest in this kind of learning, students who preferred to be spoonfed. Issues shared between primary and secondary included fragmentation of the school day, interruptions, lack of resources, lack of access to technologies, lack of help with and training in the use of technology, lack of technical support, large classes. Tertiary teachers perceived themselves to be better resourced.

However, lack of resources or technologies, for all teachers, including the primary teacher working in a school in a very low socio-economic area, was not seen as a major constraint. Appropriate resources at appropriate levels was an issue of more concern. This is explored below.

Student expectations of learning: The issue that emerged as being of most consequence was level (primary, secondary, tertiary) and student expectations of what learning was at particular levels, and students' learning and reading skills. This was seen as being different from, though related to, attitudes to learning or motivation (or any of the self-as-learner issues underpinning the framework like self-efficacy, attributions, self-regulation). This is elaborated below.

Curriculum: None saw the curriculum documents or their institution's curriculum policies as particularly constraining to this kind of learning, or having any major influence on their choice of teaching approaches. At school level curriculum documents and policies were seen as 'background', but there was acknowledgment of the significant changes the curriculum statements and other dimensions of the 'reforms' had brought, particularly to primary school, and to teacher's roles and loads. Several comments from tertiary and secondary teachers indicated that they saw primary as 'further ahead' in terms of the implementation of the curriculum statements with their more specific focus on essential skill as well as learning areas, and the built-in requirement for enquiry-type learning approaches.

T: ...primary having to change, but secondary - it's really changing the whole system of qualifications and assessment that's been entrenched for so long.

There was a perception that primary focused more, and more successfully, on what was referred to, by the tertiary teachers, as 'learning to learn'. A secondary teacher commented:

T: I know there are some very very good secondary teachers in the system and I know that many of them have been pitifully undertrained in student learning - in the actual physical aspects that go into student learning, the intellectual and emotional aspects of student learning. They've got fine curriculum-based degrees but they really don't understand education.

Teacher education was a theme that recurred in several conferences. These senior, experienced teachers were all concerned that the shift to three-year teaching degrees produced graduates who knew little about learning, and about applying it in classrooms:

T 1: ...exactly, and there's a really strong pressure on them to become more 'academic'.

T 2: And there's a big fallback now on the Associate Teacher to fill in a lot of those gaps.

T 1: ... a massive expectation

T 3: I'm afraid \$3.16 an hour doesn't do it for me.

T 1: no, no, and if you're going to pick up on things like CILL you need a lot of time for planning and preparation, and to put stuff in place (murmur of assent).

T 4: ...two of us had had teachers from teachers college. Both were very enthusiastic, but I found I was spending masses of amounts of time after school... talking and explaining... things that we were quite horrified... understanding... things that weren't even discussed or talked about (like) the (curriculum) documents... such gaps in the very basic understandings of how kids think and what

to expect... quite fluffy (murmurs of assent)... they want to do it well and they're so enthusiastic, and suddenly hitting the classroom...a little bit threatened because of, yeah, whenever you go into any sort of class you've got to have some background knowledge and experience to help you try this method or that method or this way or that way...

One primary teacher made several mentions of the new curriculum statements as requiring a different approach to learning from students, and saw the challenge of the new curriculum as teaching children of all ages to think for themselves.

T1 : One of the things I was thinking about in relation to all this discussion about the documents... one of the biggest changes now is asking kids to be thinkers, whereas in the past they have been doers... I'm thinking of the maths one. A lot of teachers had difficulty adjusting to the mathematics curriculum because they'd often spent quite a lot of time, well, passing on information and practising mathematical concepts with kids, but all of a sudden there was a problem solving approach and our kids were not used to that type of approach. They didn't have strategies... so teachers had to do a lot of talking, a lot of modelling, a lot of practice of different ways of solving problems, and I think that's coming through all our documents, and a lot of us as teachers don't have the skills or the knowledge to develop those strategies in kids.

There was general agreement that more and more was being required of students, many of whom, previously, would not have been in upper secondary or tertiary education. In other words, the students themselves, and their expectations, were perceived as more constraining to this type of learning than the learning/ teaching expectations embedded in the national school curriculum, or even NZQA or Education Review Office documents. There were several comments reinforcing the suggestion that teachers felt under enormous pressure, resented being required to implement and *consolidate* new curriculum statements and approaches to teaching, assessment, qualifications and examinations without either adequate inservice training or adequate time to implement the changes.

T 1: little bit like a bad model of learning or teaching. Like Gwen said, all the documentation says that's the way we should be doing it. That's the way children learn best... but yet there's no modelling, no support to get people into using this type of modelling learning, because it does seem to answer a lot of the questions of meeting the requirements according to ERO or whatever, and yet there's little true support in helping teachers to implement it successfully.

T 2: Isn't that because it CAN'T fit?

T 1: No, I think its because what always happens in these cases, and I'm old enough to have seen it twice now is that they come up with these brilliant documents and the practice doesn't change so you sit looking at it. I mean thirty years ago I was sitting in a teachers' college lecture theatre listening to somebody pontificate on about the joys of this new curriculum document, and it was being taught in completely opposite philosophy, and this is exactly the same thing. We've got these wonderful new curriculum documents, this new approach to learning, but nothing is changing in the practice of (general babble of agreement, everyone talking at once).

T 3: Won't release teachers so they can do the training and the thinking.

T 1: Exactly, and so I mean, it's all an exercise in futility except for the subversive few... (general laughter, agreement)

T 3: depending on teachers' good will...

T 2: Yeah, teachers' good will 'cos, as I see it, there's so much more of a workload for you, and I'm talking more about primary and intermediate, and probably secondary as well (interjection: exactly) you don't have the time...

While there was acknowledgment that the new documents (school curriculum, ERO and NZQA) all favoured the problem-solving enquiry model of learning which CILL represented, at all levels teachers felt that this way of teaching was still a minority choice, and that many teachers just went on teaching the same way.

Our way of teaching is perhaps ahead of requirements we have to meet?

Resources: The level of resources, particularly technology-based, was a concern to all primary participants:

T 1: The reference material that is available... like encyclopaedia information and CD Rom information is almost invariably at an adult level... that makes it very difficult for children to translate those things even using things like highlighting and cutting and pasting... makes it very very difficult for them, and I've just been experimenting with the Internet. Providing you can get onto bookmarked sources of information and email people who are authority figures, or go into something like K12, it may well be a better source of information for children than some of the more difficult material like Encarta .

T 2: ...The encyclopaedia in our library is quite old and certainly doesn't give us the stuff we want. We don't have CD Roms at our school... can't afford them. We're just doing a heck of a lot of deducing from pictures... They're just guessing and deducing and gleaning information from what they've seen. We have a big National Geographic library in our room and... we're not really using those normal resources at all... we're really going by the bones of our... (all laugh)

T 3: Pictures... and that's a really good point. We tend to get narrowly focused on what information sources are valid and that's another really good source.

T 2: The information that is presented is determined by adults perhaps (interjection: exactly) and it's not the way children think. And what they want to know is... adults probably think, 'No one would want to know that because it's too basic' and so a lot of those basic things that kids want to know about are not been included, whether it's a CD programme or a book or whatever...

Use of the framework was seen to drive more purposeful use of resources:

T: I think using the Framework gives the kids a fairly equal footing in terms of... they can do each step to their own level or ability, and because you can go away and get the resources that you need, whether it be a computer or a book, or just a picture in a book, they are still capable of using most steps of the Framework with a reasonably limited ability... They're not brought down by their lack of reading skills. That's what I like about using a framework like this. All the kids have got a reasonably equal opportunity to achieve (general assent).

CONTROL

As expected, given the criteria for joining the project, teachers supported the notion of self-directed, student-centred enquiry-type learning which they saw as related to learning-to-learn skills and lifelong learning. They supported the notion of students needing to *learn* to control their own learning, and supported the notion that the teacher had an active role to play in this. However, 'control', although it was defined in the context described

above, was ambiguous. It was used several times in relation to what teachers did as classroom management to shape the behaviour of students. 'Control', therefore, carried connotations of teacher activity of a disciplinary and authoritarian nature - in fact, the opposite of encouraging self-directed, self-regulated learning! This was mentioned by the researcher. Several agreed that they didn't relate to the word control, but could not think of an alternative. They did not see it as important. They understood what it meant within the model and supported the concepts. In later meetings it was used more often in the context in which it is intended in CILL. Two comments from different teachers from one transcript show the ambiguity of 'control':

T 1: It's a control thing. At primary it's a lot more open. They're investigating; they're finding out. There's a lot more scope for freedom, whereas at our level, at tertiary level, and I daresay secondary level - and that's where it starts - they are told 'You are learning this, you are learning that and you are learning... and this is the way you will learn it' and they lose the spark; they lose the desire to find out a lot of stuff...

T 2: Goes back to what Gwen was saying that choice controls the learning, doesn't it, and lots of control doesn't give choice... (general agreement).

The issue that came to dominate early discussions was, as indicated above, the influence of students' own expectations of learning. Differences between primary, secondary and tertiary learners were the subject of animated ongoing discussion. Primary students were more likely to love learning, to bring with them, or have re-kindled with relative ease, their pre-school love of enquiry, love of facts, of finding out, of acquiring knowledge for its own sake. However, even at primary, this approach to learning had to be fostered and could not be taken for granted. Many students, including 'gifted', had learnt the 'recipe' for projects and sometimes resented being forced to expand their thinking beyond the parameters of this tried and trusted 'information-pastiche, collectomania' recipe.

T 1: I think there are some children that are reluctant to get into that thinking and that grappling. They'd rather have an easier way especially if they aren't used to doing the thinking for themselves (general agreement). Other children love it; they just relish throwing questions at you and thinking about it; it's an 'Oh but, what if?' sort of thing and others will sit back and say 'Do we have to think about it?'

T 2: Or even if they do think about it in the class once they get out the door, that's the end of it...

At secondary level, there was still some evidence of inherent love of knowledge but factors like socio-economic and socio-cultural background, parental views on learning, access to books or computers in the home, were seen to influence attitudes to learning.

T: Many kids come from homes where there's not a book in the house. There might be two or three TVs, but there won't be a book. What we're looking for, I think, is not so much the disparity in learning styles than the disparity in the kind of cultural capital, if you like, that the child has when they come to the school. And there's NO way that we in the classroom with our 1 - 30 ratio can possibly compensate for that sort of cultural difference.

There was much more variation among secondary learners in attitude as well as skills. Some expected the 'empty bucket' model of learning and saw the teacher's role as to fill it: "They think that's what we're paid to do". Others thoroughly enjoyed working independently, collecting and applying knowledge.

In tertiary, there was a similar split, but here it was seen as distinguishing mature learners from school leavers. The former usually wanted to learn everything and do anything to position themselves better with regard to employment. They were more likely to

undertake problem-based, enquiry learning with enthusiasm than the latter who often had an instrumental view of learning - learning was simply to do what you had to do to meet requirements and pass. They saw the teacher as the provider of information to be regurgitated. A tertiary teacher discussed 'undoing' the secondary exam model of learning, mentioning a painfully intensive period of 're-learning' where students came to terms with self-directed learning. Some of the degree-level tertiary students who had done the first phase of their group enquiry work extremely well, slackened off and worked below their capabilities in the next phase because they had already achieved the required marks! The problem of instrumental learning, which was seen to be endemic in the higher levels of secondary and tertiary learning, militated against information literacy learning and similar problem-based approaches for no other reason than that these approaches were perceived as slow, inefficient ways of meeting requirements and getting pieces of paper.

The notion of authentication as represented in the Framework was seen, in the light of these discussions, to need to be expanded to embrace the acknowledgment that, at least for tertiary, there needed to be significantly more emphasis on negotiating the purpose and context for the learning, and the purpose and benefits of using information literacy-type approaches. The following comments from various teachers illustrate, as an example, the scope of a discussion on the difficulties of authenticating the learning within domain and curriculum knowledge, and also as a valid and valuable approach to learning:

T 1: I wonder how much of it is a) their ability to read? Some of the students coming through seem to be very resistant to reading as a form of absorbing information, and, b) whether they can concentrate on anything for any length of time?

(G interjects to mention an earlier phone conversation with someone who is absent this session in which they had discussed life at school becoming more and more fractured. She suggests considering the fractured week from the point of view of the learners and the discussion of authenticating learning... General agreement that they, and their students, were experiencing the same sense of fragmentation and disorientation).

T 2: The knowledge is just so superficial. We just mention things, not teach, just mention in passing, at least at the secondary level.

T 3: Is that because of time?

T 2: That's part of it, but it's also because of the way the curriculum and the syllabus are set out... required to teach 'ancient history' (Egyptians, Greeks and Romans) in ten weeks, but preferably five!

T 4: So difficult to do... to fit it... basically the kids want to sit down, and they want to have an hour's maths and an hour's reading... The day is just a circus from nine to three, and the kids are sometimes not quite sure which way they should be pointing... and this goes through all levels of the school... Let's have a good, firm basis, shut the doors and let's get on with LEARNING...

T 5: Just get started and they have to stop.

T 4: And then they get interrupted - very frustrating for them. At secondary... more stress involved because they know they absolutely MUST, whereas I guess at our level the world won't come to an end, but it still frustrates them.

On another occasion teachers discuss the interrelationship of controlling learning and skills and there is a recognition of the key dimension played by skills in students' ability to control their learning.

T 1: But I suspect it's more than just... I use writing skills as an example. It's the other skills that lead on from that. I mean research skills. It's the notetaking skills. It's the planning skills. It's the managing skills. Some students have them and some students don't. I can't teach them those skills. I can guide to a point. I can teach to a point but I cannot sit down and say, 'Jo Blo, within three months you will be an ace writer'... just can't be done. I only have 30 students for 2 hours a week...

T 2: Like my response when I went from primary to secondary teaching. I had this really dumb idea when I looked back at it, that when kids came to high school they were actually all ready to be at high school... silly me. I've got kids who are 16 in the fourth form with a six year old reading age. This kind of depressing statistic occurs far too often, even when you've got so-called competent and capable children. We can't do it all and increasingly our job is being massively widened. We're expected to do more and more and more, and I strongly suspect we're doing less and less well.

T 3: It's the whole fallacy of the system - that when one student leaves one level and goes to another they're ready for it. That's a fallacy.

T 4: And why do we have a very rapidly growing trade in things like Kip McGrath learning and all these other things that parents turn to... and we hear that the system fails the child, or perhaps we're just recognising that children need different help in different ways? And in the past these kids just failed the system and went out and got a manual job or a menial type job because we didn't expect them to go further, but the expectations are rising now so we're putting all these other systems in place to help but it doesn't fill all the gaps, does it? (murmurs of assent).

T 5: But there were a much wider range of jobs out there for kids to do, and now those jobs are... there's a much narrower range...

T 2: And a much higher expectation of skill too...

While the word *control* did not immediately resonate with them, this extract illustrates that there was no difficulty with the concepts involved. One of the paradoxes that emerged was that if students did not know what there was to know, or where to go, how could they control the learning?:

T 1: It's interesting, because our students don't have to come to class... half of them don't want to be there and they don't really know why they have to do it, but it's a compulsory paper, and I've got tutorials set up for them through the semester and everything else. And two out of five students I'm lucky if I see once a fortnight, and yet, they are the ones who actually need me sitting on them and giving them more control and they just opt out until they get an assignment and they start complaining about how much work it is and (G: and how little help they've had) (laughter) ...yes, exactly, and it's all my fault because the course is too hard. It's quite interesting.

G: So what you're saying is that one of the difficulties with this is that a dimension of authentication is the ability to know what you need, and be able to assess your own needs and your own competencies, and your own ability to learn in a particular way, and that is markedly not there (agreement).

T 2: And being responsible for your own learning - if you don't know you've got to somehow access that information or ask for that help.

G: And that's exactly what X was saying his lacked completely (agreement)...

COACH

While the term 'coach' was not familiar to teachers in the context of this type of learning, it caused no confusion, and was seen as a useful metaphor, fitting into the general perception (based on experience) that students at all levels needed a lot of help with this kind of learning, and a general recognition that students would seldom be successful *without* the teacher playing an active role in the process. There was no evidence, however, that teachers saw the role of the coach as significantly different from their normal roles as teachers. Coaching, in effect, was interpreted as a synonym for diagnostic teaching and 'support'.

There was, likewise, no perception that the teacher's active role in the process, including direct teaching of skills where needed, conflicted with their commitment to developing confident, self-directed learners. There was an implicit assumption that confidence, independence and self-direction, like information literacy, are relative to the age and sophistication of the learner, and that most learners needed a lot of help to become *more* self-directed, more independent, and more information literate. This was related to changes in education:

T 1: I think that what we're on is the cusp of a great change in learning and in the past... we've been looking at education based on content and smushing as much content as possible into those little pitchers or brains as we could. So it was a matter of acquiring the culture by acquiring the content. Now we're at a time when we have to teach, not content so much as content plus a high degree of skill. (General assent)

A second teacher continues the dialogue, linking the notion of learning-to-learn with strategies compatible with the cognitive apprenticeship expert-novice notions:

T 2: Perhaps... the most effective ways of learning are by seeing other people doing it and 'Yep, that's how you do it', so they try and try and they try until whatever it is successfully. It's still going back to quite a basic way of learning, isn't it? They see the so-called expert or the model doing it, so... Someone has to show them to begin with, don't they?

Coaching is also linked to the skill requirements of the new curriculum documents and the key (to CILL) notion of students being coached to *reject* as well as select information:

T 1: Had to go back over a lot of skimming and scanning skills, and I did give the kids a grid for notemaking and that made it really easy for them. Some of them got so enthusiastic they were finding all sorts of information and writing it down, and I'd have to work beside them and say 'OK, does that answer your question? Do you need to discard it, or do you need to keep it?'. So again it was that thinking what was relevant and what wasn't.

T 2: It's really hard for them, isn't it, you know, keeping them focused?

T 3: You've got to be with them, I suppose, to help them, work with them, and, again, I think it's the new documents, we're asking them to do a lot of thinking and it's quite new to them. They haven't got the strategies yet, and I think further down the track once it's fed in at the lower levels they should start coming through?

T 2: That's one of the problems we're facing with unit standards. The units presuppose a level of thinking that students in year 11 and 12 just don't have, and we're sort of having to scoop them up and bring them screaming and kicking into this concept of, you know, what is the writer's purpose? (murmurs of assent)...

T 1: And they haven't got that self-talk either? It's just not there. They're not asking themselves the questions, and they're not thinking through the processes...

T 2: They're wanting the right answers. They're still wanting ONE right answer (loud agreement).

T 4: And on the other hand they find it hard to keep themselves just to the answer on their question, don't they. Now we've conceded. In our little notepads we have a general page, and they find that really need that. Otherwise they find that they get frustrated... they've learnt this really juicy little bit of info. and the teacher says it's not needed! (laughter)... (lots of voices... interesting facts, another page of, you know, interesting information)...

T 1: Don't want to discard it, but they've got to, you know, make that decision if it's appropriate.

Coaching is also becoming a synonym for teaching. One primary teacher comments:

T: I've been winding up with a group and I've been finding the coaching is getting more and more intense, going around the group. I think some children are pretty unsure about some things they're expected to present, and that may be why I'm doing a lot more coaching and prompting. I need to keep on working it like a class thing, you know introducing skills, and going through the model and doing a lot more problem solving, and what X said about the questions : Is it specific? Does it relate? We have a part now where we just share at the end of each day new things that we've found out even if they weren't related and discussing these ideas and clarifying them and setting new directions, so that next session they are actually clear about what they're going to be doing...

The comments which became a pivot for elaborating on teachers' understanding of the role of the coach were the researcher's frequent interjections that she wanted to avoid being prescriptive and providing recipes to teachers; that she saw the CILL Framework as a menu rather than a recipe for information literacy learning, leaving room for teachers to use whatever they wanted in any way they thought appropriate. She was particularly keen to keep the framework at the levels of prompts which suggested WHAT teachers could/should be doing, but not HOW they should do it.

Teacher responses indicated acceptance of her desire not to be prescriptive, but revealed a consensus view of what they needed which was consistent across levels, although the precise nature was seen to need to differ across levels. They wanted a level of prompts and strategy suggestions that the researcher, initially, saw as prescriptive and not commensurate with the constructivist ideology underpinning the framework. Varied and frequent suggestions, over the weeks, were made with regard to how teachers saw their need for more prompts and strategy suggestions being accommodated within the 'coach' metaphor. Teachers saw more specific lists of prompts and strategies as in no way prescriptive, in no way compromising their professional prerogative as teachers. In contrast, greater elaboration and specificity expanded the menu concept. This would save time, triggering ideas for teaching, monitoring and evaluating, and providing useful prompts which learners themselves could use to help guide and monitor their learning.

The researcher came to the conclusion that they were correct and that their ideas could be accommodated without compromising the constructivist nature of the framework.

Evidence related to the use of the Framework's 'props' (Appendix 3b)

All the teachers saw the Framework as being useful for a variety of purposes. After the initial meeting where there was concern that they might have to 'do' the whole framework, teachers iterated round the 'props' with increasing confidence, using the framework selectively in two main ways.

Firstly, several teachers used the framework to plan and monitor a new learning sequence, using the 'props' to focus the sequential stages of what was recognisably an 'information process' approach. They used the opportunity of the meetings, and the framework itself, to focus their monitoring and observations on student learning. They tended to use it diagnostically, commenting on specific aspects of student learning in the current learning sequence, but also more generally in relation to past experiences and overall perceptions of student learning in relation to specific areas of skill or strategy focussed by the Framework 'props', for example, questioning skills, selecting relevant from irrelevant information, getting 'sidetracked', verbatim recording of any information that appeared interesting even if not relevant to the learning purpose, downloading 'slabs' of text from Encarta, waiting to be told by the teacher what to do, where to go, how to do it, and when it was finished!

Secondly, some teachers used the Framework as an opportunity to reflect on how students undertook this sort of learning, and used the 'props' to focus their analysis of learning that was currently in progress, or previous attempts at implementing similar approaches to learning. They were consciously using the Framework, and the opportunity to discuss learning during the meetings, to reflect on and deepen their own understanding of this type of learning and of student approaches to it - in general the barriers they perceived, but, specifically, the value of the focus (in props 1 and 2) of considering what, for example, authenticating learning and student ownership of learning meant in real terms, and how they could help to improve student commitment.

Increasingly all teachers used the Framework in both ways. As the language and concepts became more familiar and were internalised, it became common for teachers to home straight in on discussing teaching and learning - what students were doing and what they, as teachers, were doing - without specifically relating their comments to the Framework, except in passing or when prompted by the researcher. It became obvious that the function of the Framework in focusing their thinking on student learning was what they appreciated. The Framework was mentioned as being referred to at home and in the course of classroom teaching, a welcome catalyst and reminder. For example:

T: You've got to have something to go back to. And I find before each phone call session I get those pages... 10 and 11, and I've got a copy at school. You've got to have something that you can keep revisiting and checking yourself off on.... for myself... this is not what I do with the children at this stage. You've got to have that something there as your guide...

Teachers clearly enjoyed the opportunity to talk about learning, and this type of learning, with likeminded colleagues. Several mentioned colleagues who simply were not interested, serving out their time, or who perceived learning and teaching in a completely different way. It was implied that this was a lonely way of teaching - they often felt unsupported in their schools/ institutions in their attempts to implement this kind of learning. At tertiary:

T: I was thinking of the policy... and the larger numbers of students per lecturer and the sheer mechanics of it seems to be an issue which means that you are like a salmon swimming upstream against the current, as it were. Because it just does seem to me that lecturing is an efficient method of getting information across to people quickly, whether or not that's what you believe about education and how it should be, and the pragmatics and the economics can dictate what the pedagogy is going to be like (agreement)...

Several explicit mentions were made of educational administrators (and the Ministry and NZQA) paying lipservice to concepts like lifelong learning and learning-to-learn, but, in reality, giving little support and resourcing to the types of learning seen to achieve these ends. In fact, they saw the opposite as true. Particularly at tertiary, and to a lesser degree at secondary, implementing this type of learning was flying in the face of what was

unofficially sanctioned, even if the institutional rhetoric said otherwise. The fact that a up to 70 per cent of learners' time at tertiary was devoted to independent work while both tertiary institutions were cutting student learning services, was seen, cynically, as an evidence of rhetoric versus reality.

Much of the valuable discussion on learning cannot be seen as evidence of the Framework's 'success' or utility with these teachers. One of the main benefits of the Framework was the provision of a common technical and *conceptual* vocabulary to frame early discussions. Several explicit mentions were made of the benefit of hearing how teachers at different levels were approaching particular aspects of the teaching.

It could be argued that any such framework would achieve the same, but Moore's (1998) and Kuhlthau's (1993a) did not, as discussed in Chapter 5. Indeed, the course based on the current New Zealand information process framework is predicated on exactly that expectation. What distinguished these discussions, in the researcher's opinion, with ten years' experience of national moderation of New Zealand's national information process course as substantiation, is that the time spent discussing the model's three cornerstone assumptions reflected in far more and deeper analysis of the underlying ideology and rationale of this sort of learning; the *why* of student learning rather than the *what*.

The Framework, and, in particular, the 'props', were also seen by teachers to, potentially, provide a common approach that could be used in all curriculum areas at all levels from new entrant to tertiary. This could underpin a 'spiral curriculum' and provide the basis for coherent approaches to planning and assessment. Many of the suggested changes to the Framework were explicitly intended to make things simpler for teachers. Clearly it was perceived that the Framework would be useful to other teachers.

T 1: I think originally for teachers who may first lay eyes on this and want to try it, that teachers are still going to be like children. We need a fairly concrete prop.

Another qualified this, talking about teaching process as well as content:

T 2: I have no grumble with that though I think students need to come to us with the skills and then we facilitate them to learn at a higher level. Just thinking because of the time constraints, and other constraints that we have, whether or not the actual model is applicable at tertiary. And I'm someone who's a student-centred convert, and have been preaching that gospel for some years, and learning heaps about it... It almost sounds sacrilegious to me... but I'm just questioning... One of the things I do see is that primary is markedly different from tertiary.

Other teachers disagreed. One comments:

T 3: Here on page 10. Information literacy learning is a process of learning to learn'... putting the students at whatever level through these processes, we're equipping them for, as you say, whatever problem is going to crop up. They're going to be far more capable of tackling it themselves, of knowing HOW to tackle the problem, and how to work through the process and get to the other end. To me that seems a dead cert. I don't know. How do the tertiary feel?

A tertiary teacher responds:

T 4: If you've got mature students who do want to learn, it can work incredibly well.

But later elaborates:

T 4: It's the time for preparation, and the other thing is the time for the coaching, if you've got 30 students or 50 students or 100 students and you want to see them for quarter of an hour each...

It was clearly perceived by some to have utility as a learning framework of sufficient flexibility to accommodate all kinds of learning, not just information literacy learning. One secondary teacher felt that, given the prevailing constraints and conditions, it might be more appropriate applied to 'research' activities at tertiary level. The tertiary teachers, in contrast, saw its potential use at tertiary constrained, not what it was or wasn't, but simply by the whole tertiary environment and the reproduction and regurgitatory types of learning and teaching that prevailed, official rhetoric notwithstanding, at their level.

Teachers' responses clearly indicated a different perception of its utility when they were talking about the Framework in its entirety, and when they were talking about using elements of it (particularly the 'props') to focus on specific aspects of student learning. The whole Framework was seen to reflect, but deepen and enhance, many of the approaches to learning currently being implemented in primary and intermediate classes. Implementing 'the whole Framework' was seen as a luxury constrained by time and curriculum coverage demands at higher secondary levels, while the 'props' were seen as a useful focus for highlighting particular cognitive or self-management metacognitive or metalearning skills. At tertiary both the whole Framework and its elements were seen as both problematic, but also, ultimately, essential for 'lifelong learning', and there was a feeling that it would help these lecturers to 'play', experiment and find their own way through the problem. One had, in fact, already begun to adapt the framework to meet the specific needs of his learners.

T: Yes, well, actually, I've sort of taken the CILL Framework and 'Ripping into Research' and sort of adapted it into a form for these students, these tertiary students, at their level so they understand, and I've called it a framework for research and learning because that's what they understand they're doing. I've just broken it up into a series of steps in a similar sort of way as Gwen has done in 'Ripping into Research'.

This exemplifies the researcher's intention in designing the Framework like a menu which teachers could use to select components to enhance their teaching in this area.

Evidence of changes in teachers' approaches to teaching information literacy learning

All the participating teachers commented in general terms that they had found that using the Framework had benefited their teaching. It was more difficult to disentangle, from their responses, exactly how, where and why. Several mentioned that it had helped them to sharpen their focus on this type of learning, to be more aware of what students were doing, and were not doing, and their need to guide the students. There were frequent questions about how *exactly* it could be fitted in and taught:

T: Yes, yes, that's probably testing my mind more than anything else. I don't disagree with you (previous comments related to perceived value of framework). I think it's more in how one goes about it, how one goes... (interjection: especially if everyone else in your department is still running the old way).

Several recurrent themes emerged. These have been summarised below:

Designing learning vs planning: An issue that recurred, prompted by the researcher in several instances but in others arising spontaneously, was that of classroom-level curriculum planning practices. It was generally acknowledged that this type of teaching required, firstly, more, and, secondly, different planning and preparation from that usually undertaken. The term 'front end loading' was coined to express the notion of more systematic *mental* rehearsal of the learning, resourcing, management, monitoring and evaluation than normally practised.

T: The tertiary perspective... what I find here, and X will probably back me up... probably everybody will, is the TIME to actually get that proactive stuff down, you know, to actually get it typed up so that I can get it photocopied and distributed. And it actually does take a lot of time to think it through and get your words right and everything... (general agreement).

Strategies for authenticating and establishing ‘ownership’ of learning:

Particularly the tertiary teachers noted that they were already, or were intending to, undertake the planning phase with far more time and thought given to thinking through exactly how to authenticate the learning (make sure that the students were *really* aware of the value and rationale for this type of learning for them, personally, and in terms of their course content), and ensure that checkpoints were negotiated so that monitoring could be more systematic, and students would have more ownership of the learning through discussing each stage with the lecturer:

T 1: I think it's hard to do it, and I think it's an area we've got to push because, talking to some of our past... students who've graduated in the last couple of years... I think one of the most valuable things we can do is give them enough confidence that they can tackle problems that they've never seen before, no matter what they are. And it's a matter of trying to build it in. I often say to my students 'You know, this is an assignment about two things. One of them is the content, but I also want you to go through a process and I try and... if I can involve both of them at the same time, at the end of the day I think we can get there.

Another teacher explored the notion of authentication and ownership by experimenting:

T 2: If the learning is going to work, it has to be hooked into something they know. It has to be hooked into their own experience, and they have to own what they're doing. Otherwise it's just not going to work. They're just going to go through the motions. I tested myself out. I gave them (laughing...) a worksheet just to prove to myself... and boy they were really quiet when they did the worksheet. They worked really well, but it was SO boring the responses they gave me. It just wasn't... I'm sorry I have to do those things sometimes! (laughter).

Strategies for developing self-efficacy and self-regulation of learning:

A dimension which was emphasised by one teacher on several different occasions, related to the need to use checkpoints to negotiate criteria by which students could evaluate their own learning, both in terms of content and skills. This was not something explicitly picked up by other teachers in their responses, despite the researcher's confirmation that this was exactly what she meant by proactive coaching - that checkpoints provided the opportunity for teacher and students to work through what was going to be done next, how it was going to be done, to what standard.

Proactive coaching was seen to relate to the concept of ‘conferencing’ by the primary teachers. Secondary and tertiary responses reflected a tendency to assess whole pieces of work reactively ‘by walkabout’, discussing work with individuals and groups, ‘keeping them on task’. Secondary and tertiary discussed formative monitoring:

T: I decided that what we probably do is give kids too many HUGE tasks which overwhelm them. What we need to do is, call it props, call it structures, call it whatever you like, but we need to... help them track through their learning, give them small enough chunks so they can have success, rather than overwhelm them with text...

One primary teacher wrote about inserting checkpoints at the beginning and end of every lesson to give students the opportunity to confirm where they were in the process:

T: It helps to set the scene for the session(s), clarifies any confusion(s) and gives the teacher the opportunity to see/ note down what is likely to happen and what strategies may need to be developed/ materials or resources gathered. There is also the very important debriefing session at the end of the period.

Teachers at all levels noted the need to be quite explicit about what was expected in terms of quality of work rather than quantity. They could see the need more clearly now to establish, right at the beginning, that what was wanted was not 'screeds of paper', but tightly focused information related to the particular learning purpose or questions being investigated.

Coaching strategies were linked explicitly to helping students to improve their learning in different ways. Coaching was linked to modelling and monitoring:

T 1: So coaching and modelling are what you're doing too, and monitoring what you're doing (assent)... especially the modelling part. I think that's really important.

It was related to catering for individual needs:

T 2: Whether you've got five or thirty students, potentially they're all going to be at different spots with different needs anyway... coaching is more responding to their individual needs. You know, they may be on different subjects, have different problems, and you may end up... I sometimes think I need a tape recorder... saying the same thing thirty times. They've got to be ready to hear what you're saying...

Another teacher comments:

T 3: I like the idea of coaching. We agree that it is not structured teaching...that is, not teacher-dominated but the proactive... I tend to think in my mind of going where the need is, so you're not perhaps teaching your whole class, teaching everyone all the skills that are needed, but [you] either coach what show up as a gap (like with netball where the coach has to give a new direction or instructions on how to solves the problem)... where you're sort of getting in before the need overtakes what's happening with that child and what they're actually doing.

Coaching embraces affective dimensions of teaching:

T 4: Perhaps coaching is a bit more like nurturing rather than telling or dominating... you're nurturing them along, or guiding...

Coaching also embraces the notion of 'partners in learning':

T 1: I think when you're doing the coaching, if you show the children that you're there with them as well, that, you are, you know, an active partner in the learning process, and... all through your prompts you've got 'Get and give feedback'. That's really important, and you can do that through your brainstorming and stuff, like you do at Stage 1, and going backwards and forwards through that, clarifying their ideas.

Another teacher raises the cognitive dimension of the coaching:

T 5: I think... the teacher needs to question... pose questions to the students so they will do the thinking. You're not giving them direction like the netball coach, like 'go out and do this'. You're saying "Hey, this is happening, what can we do about it? How can you solve that problem? What do you think you need to do? (general agreement).

Cognitive strategies: Teachers at all levels noted how much more emphasis they needed to place on what became known as the 'middle bit' of the 'props', the skills

needed to 'interview', understand, collate, synthesise, interpret and analyse information. At all levels the habit of copying, photocopying and downloading 'chunks' of undigested information was alive and well. A secondary teacher talks about using the Framework:

T: Accessible, isn't it? And I think that what it does is encourage kids to think their own ideas through without having to dive into text. What I found with my kids the first time round when I did the... essay was that they immediately wanted to copy out large chunks of text and I... really horrified me because I knew they had really good ideas and I had to find a model that drew those ideas out in some kind of natural order.

While several primary teachers made strenuous efforts to focus on this aspect in the first cycle, all noted areas in which they could now see room for improvement. On the whole, this was the aspect of student information literacy learning seen as most in need of improvement at all levels, and where the Framework was useful for highlighting specific deficiencies and allowing teachers to plan to address these in subsequent work with students.

T: Almost universally the most difficult phase of the whole process is when they've found their information and they're trying to process it into some form which is meaningful to them - in our older terms it would be 'writing it in their own words'. This is by far the most time-intensive and difficult; from a teacher's point of view it's the most difficult - certainly the most amount of time is taken up working with children individually and I think there are several reasons for that.

(Referring to 'props' 2, 10) ...all of them without exception found it an enjoyable activity, and I think they found it enjoyable because of the element of control. They did feel that they were finding information that was of interest to them, even if the quantity and what I would call the quality of information that they were able to synthesise for themselves was of a fairly indifferent quality. [However] children that I would have expected to do well did not do so, and others whom I expected to do well DID do well!

Teachers acknowledged the need to recognise the changing presentation of information which required different 'processing' skills, and the need to allow, consciously, for a variety of literacy levels and preferred approaches to learning. For example, in relation to the idea (prop 7) that information had to be analysed and synthesised to 'construct knowledge':

T 1: Well, do we... expect everyone to be able to interpret... thinking at tertiary level? They have to go and get that big thick book out of the library or turn to that Internet page, or email to get info from someone, read that and interpret it. Is that our ultimate aim or is it the getting of information?

Why should getting information out of a textbook, or an adult book or magazine be any different from giving a five year old a picture book about insects and saying 'OK, what can you learn about the physical structure of an insect?'. Now what's the difference between that child looking at that and learning from the pictures... and a tertiary student? What about those kids who can't read a book? Why can't they not sit down and interview you... so they learn to get information that way (interjection: that's right). It's not always out of a book or off a computer screen. We've got lots of other ways of getting information... (talks about getting information from a video).

Another teacher continues:

T 2: A lot of information is presented now visually, with infographics, pictures, diagrams and kids have to learn to get that information as well (two agreeing). And it's not easy for all children to interpret statistics and graphs and Venn diagrams

and those things, but they have to learn those skills and well as the reading and the processing and the testing ...

If you just look at the newspapers now and how that information is presented to the readers - far more visual, a lot more photographs and diagrams, a lot more colour. There's a big change in the way information is being presented to us adults as well as the children.

Collaborative learning: Collaborative learning and reciprocal teaching were seen as natural corollaries of this type of learning:

T: It begs the question too... that not only should we be helping them to learn, but learning how to learn in the full richness of it. I'm thinking about problem solving techniques. I'm thinking about thinking techniques, and they're interrelated anyway, but we could extend the amount of things that we get involved in. Now we could take it further - cooperative - learning how to work together in groups, cooperatively and collaboratively, and so on.

Evidence of changes in teachers' perceptions of students' information literacy learning

While the overall focus of Teachers' Cycle A and B was diagnostic, several teachers reported introducing the CILL Framework and project to students. For example, one primary teacher introduced the triangular CILL model to her students, explaining what the word constructivist meant by using the concept of construction, drawing parallels to foundations, notemaking as the basement, and the like:

T: Set it in context by relating it to 'Something Zany' and talking about Gwen who was someone who was really interested in how kids learned, and about the project, and that they'd be asked... Talked about information, then talked about literacy as knowing how to learn, knowing what to do when they are learning. (They) joined in. Quite impressed that they knew what these three big words meant. Used their example of hedgehogs to discuss how some of the info they'd found had become knowledge...

This teacher showed students the CILL Framework:

...became impressed when they realised that they'd already done the first steps (from the pupil's column) of what, initially, had looked like a bafflingly complex framework. Building on the initial work done with them on reconfirming their skills and competencies, this has added to their sense of control and ownership, and confirmed for them that they really can do this sort of thing.

Another teacher comments after a session on identifying and using key words:

T: Really feel that they are being supported and not frightened of taking risks with their learning.... interaction in the groups is better. Everyone is getting into it and there are no strays hanging back. Up to the first draft, looking at how to set it out, etc, who they're communicating the info to. Some had no idea of who they were going to communicate to, and making it suitable for those people.

One teacher comments on working with nine year olds who are using 'older' material, advising them to:

T: 'weed out all the gobbledegook. If it doesn't make sense to you, if you don't understand it, get rid of it. I'm only interested in the bits you can understand'. Seemed to help some of them. 'Does that help you?' Most said that, yes, it was a big help. Asked how the business of cutting and pasting worked. Good feedback from them.

Several teachers mentioned tying key words and notemaking into knowledge mapping:

T: ... a lot involved for children, particularly for the younger ones. I might read them a paragraph and they jot down their key words. One says 'I've got 45 key words!' Then in two days time they write several paragraphs from it so they're learning that we can take the notes one day, and come back to it two or three days later and see if they can make sense of them. So they're learning to take more than just a word - two or three words so they can remember what it was about, but they are not trying to write whole sentences. Made a bit of a game of it, but it's made them realise about getting the right info and then trying to number things so they can go back to the notes and put on an 'A' or a number code, for example, the number of animals who are a threat, and then the kids can take relevant info from whatever they're listening to or reading and go back and give it those codes.

Discussions raised the issue of 'bright' and 'gifted' students who often did less well, relatively speaking, either because they hooked easily into 'project mode' and gave the teacher what they perceived was wanted without extending themselves, or were perceived to be performing to the label 'gifted' and were reluctant to take risks and be less than successful. Evaluating the work of a very capable student reinforced that 'good' is relative:

T: He is quite a capable boy and I said 'You know, you haven't really challenged yourself mathematically, have you?' because he got the information and he was able to find out what was different, but it wasn't a real challenging problem-solving investigation... And he also presented it beautifully... it was a wonderful presentation, but I was disappointed because he didn't push himself, and I think again, as I've said, I think some of these able kids stay in that comfort zone...

Despite several discussions that CILL might be better suited to some children more than others and to more able children, there were several mentions of less able children demonstrating all the attributes of ownership, authentication, motivation, self-efficacy, and the like:

T: I was delighted. This particular boy... he's got no concentration. We were doing speeches this morning and I actually noticed that he was totally sidetracked. He was fidgeting. I've got a wooden box full of National Geographics. I thought 'Oh, blow you, J, I'll just leave you to it; you're obviously busy, and then in the next session after play he came up with, 'Well, I saw in this picture this morning da da da da', and I thought, 'Well, that's his way of getting information' (general murmurs of assent). And I thought, 'Well, why not, if you're not a good reader and, you know, I've got a few of those...

Learning/teaching issues that emerged as threads throughout the conversation

These included:

- **authentication** and **ownership** of learning; seeing this approach to learning as personally meaningful, valuable and relevant (secondary and tertiary);
- fragmentation, lack of **time**, pressure on students and teachers (all levels);
- the 'X' factor in sparking/ **motivating** students' love of learning, interest in finding out and building knowledge (arguably easier at primary but needed throughout);
- **deficient skills** in nearly all learners in the cognitive dimensions of selecting (rejecting), analysing, collating, synthesising and interpreting information, ie transforming information into knowledge (all levels);

- the need for, and perceived value of, **coaching strategies** to highlight these cognitive dimensions of information literacy learning, particularly if translated into level-specific prompts - prompts for teachers as well as students (all levels);
- the need for, and perceived value of, easy, practicable strategies for transferring more responsibility to the learner, for encouraging **self-efficacy**, **self-monitoring**, **metacognitive** and **metalearning strategies** (all levels).

While in initial (5A) discussions teachers explored their own knowledge, knowledge of each other's teaching contexts, and understanding of the CILL Framework through highlighting their *differences* and the reasons why they could not achieve this type of learning with their students to the extent they wanted, in Cycle 5B what emerged was agreement of the needs and trends highlighted above. How these needs and trends manifested themselves at various educational levels differed, but the recognition of these issues was a consensus one, as were the changes recommended to the Framework.

Changes recommended by teachers to the Framework after Cycles A and B

These included:

- incorporating the two levels of prompts discussed above;
- replacing the coach/ control narrative maps with a simple outline of what the teacher does as coach, and what the student does. (It was felt that the maps only became really valuable after teachers had developed familiarity with the model, framework and process);
- having a really simple introductory graphic (first draft already circulated);
- making the end pages (the prompts for teachers) more 'teacher-friendly' and graphic;
- expanding the menu concept (as outlined previously) to include possible coaching strategies for teachers to select from, and possible learning strategies and prompts for students for teachers to select from.

These emerging themes and changes were acknowledged and incorporated into a substantially revised version of the CILL Framework which was introduced at the start of Cycle 5C (Appendix 4b).

CHAPTER 8

INFLUENCE OF CILL ON TEACHING AND LEARNING: Evidence from Teachers' Cycles (5 C and D)

The research process

From July to December audioconferences were held fortnightly, ten with the whole group, and six loosely structured interviews with individual teachers. Winter illnesses took their toll. Each teacher was absent more than once. Secondary participants both experienced major family illness which limited their participation at the end. One primary teacher was hospitalised with back problems. However, personal correspondence (mail, email, phone) increased. Issues raised by individuals were, with permission, summarised and included in the meeting transcripts which continued to be sent to participants after each meeting, so all participants were kept fully briefed and able to participate. The framework for summary and analysis (the framework of CILL concepts and propositions) was maintained in these cycles.

What characterised Cycle C and D sessions was how ideas and threads raised in Cycles A and B became the basis of much more sustained dialogue and debate between participants; evidence of professional 'reflective conversations'. For example, teachers are discussing strategies for getting students to analyse information to develop meaningful knowledge (Props 6 and 7):

T 1: I think that 'reflective conversation' is a really good term. It eases it, and makes it more... takes the formality away from it.

T 2: That's exactly what a lot of kids are not used to doing. I remember one little boy saying to me, 'you mean we should talk to ourselves?'

G: And that's what you said at one point, X, about the kids not having the strategies for self-talk? And I think this has GOT to be modelled. ...metacognition is based on the ability to talk to yourself about your own learning.

T 3: Isn't talking to yourself called thinking?

T 4: The children realise that there is structured thinking. You say to them, look, go away and think about this - it's just loose thoughts floating around in their head, whereas getting children to actually structure their thinking and work something through in their mind and perhaps just put down three or four words and then realise, when they come back the next day, the three or four words give them the whole structure again in their mind... They learn that they have it in their head and they can bring it back using all sorts of triggers or systems - pretty powerful for kids to have, and this comes from those skills that we teach them.

T 5: I'm not sure that I can be as specific as you seem to be able to be with it... because we're intuitive and we do things intuitively, and to be able to verbalise...

T 6: I keep telling my students that they can learn more from each other than they will from anybody else, and that by talking to somebody else you have to, you know, sort out your own thoughts, verbalise the thought... that actually does slow people down and make them think about what it is they're trying to do or not do.

T 5: The thinking is not so much analytical as more an intuitive process?

The researcher's role altered accordingly. There were fewer 'interventions'. She consciously tried to 'thread the thinking' back to Cycles A and B, plus explaining and interpreting the revised framework (Appendix 4b). Teachers liked the new framework:

T 1: I really like it, Gwen. I like the way the arrows feed back ... the evaluation goes back into those strategies.

T 2: The way it's worded there, I can see it very much applying to primary school reasonably comfortably from, you know, the young up to the older. The language there is going to apply to a pretty good range of kids (X agreeing).

T 3: And knowing where you're going as well (agreement)... I really like this new format, Gwen. It just appeals to me...

T 4: It's more user friendly, and 9 and 10 are now part of it.

While the focus in Cycle A and B had been an exploration of the context, control, coach assumptions and ten props in the context of normal teaching programmes, Cycles C and D deliberately focused on practical teaching/ learning strategies. The first four meetings dealt with strategies for designing the learning, co-directing the learning and coaching proactively. The remaining six dealt with strategies for implementing the propositions. While this did not preclude discussion of the assumptions - in fact, there was more than ever - it had the advantage of introducing an element of specificity to the discussions that had been lacking in Cycles A and B. So, for example, if all primary teachers had used, or could see ways of coaching (say, Props 6 and 7), how could it be done at secondary and tertiary? Could it be done by building in reflective *written* conversations or peer tutoring?

'Why not?' became a more focused analysis of whether the constraint was time, or personal feelings of discomfort or inadequacy, or the barrier of student expectations and increasingly led to 'How?' For example, discussing strategies related to proactive coaching and co-directing the learning:

T 1: We're onto the second question which is also very broad. I have decided to concentrate on the deciding bit because I find that when confronted with a big topic when they haven't been given a specific question to answer that's when they really struggle with planning their own learning, working out what they want to learn within the context of the subject of the paper and of the assessments and what have you. So I've concentrated on the deciding. Now I'm finding it quite hard because I'm feeling very sensitive about ... coaching the learning. You can't do it one-to-one, and you can't do it at a class level, and you can only do it for a short time. You only have them for... I only effectively have them for two hours a week; some weeks I might have them for four... I'm feeling very sensitive about it because I'm sort of feeling that ... they think that because they're at tertiary... that they probably think they're reasonably developed learners, that they've got quite good learning skills, and they find it very strange, and certainly very different because they're just, as they say to me, they're just so used to walking in and bringing out their notebooks and getting overheads and writing all the notes down and just having to sort through... and when they get confronted with me and my ideas, they... it sort of throws them, but they don't question... They just accept it, and just hope that it's going to work out for them.

But this participant is also able to be more specific about being more confident with the concepts and strategies, and less likely to apply global negative judgements on himself, the system and students:

T 1: I'm progressing... yeah, it's hard, having come from a... my technique is developing. I think I mentioned it last week, my style is developing, and has been helped by being exposed to this, doing what we're doing here, learning from this.

And being involved as a co-coach I think is vital. The more I get involved with my students the more I think that's vital, but... I think maybe their skills are a little bit better than thought although they're still not great, but within the context that I have them, the situation that I have them it's difficult.

Another tertiary participant is experimenting with the concept of co-direction of learning:

T 2: ...well, I'm thinking of doing for this first problem, was to actually turn round and come up with the questions I was going to ask each group, say the four or five things to try to get them to think, and actually put them on an OHP, and actually say, like, discuss this in each group. 'Have you done this, have you thought about it' to try to get round it. I don't know whether it would be as effective, but as you say, if you've got 20 or 30 people... effectively try and get them to think about it themselves instead of me asking them individually.

Successes and benefits from using the CILL Framework

In retrospect it became evident that for some of the teachers the first cycles had largely been spent discussing the *idea* of implementing CILL in the classroom. This signalled two things. Firstly, while all these teachers had joined the project because they were sympathetic to and interested in self-directed/ resource-based learning, between 'espoused theory' and 'theory in action' (Schon, 1983) lies a pedagogical minefield! Even the keenest and most motivated teachers simply do not know the strategies for teaching what they themselves have never been taught.

T 1: I think one of the areas from my point of view is that my skills as a teacher of learning skills are limited. What I have to do is... I now have to start thinking well outside of my subject and I have to start thinking about teaching people learning skills.

T 2: ... I believe in student-centred learning, learning for life and all that good stuff, and I've always felt that I didn't know enough actually about teaching it to actually do things properly in the classroom, and so this (CILL) was really good in terms of giving me a structure to help organise the learning as opposed to the content which I've got pretty well sussed.

Secondly, our approaches to teacher development and inservice courses in information literacy learning and similar pedagogies might grossly underestimate the time even the best teachers need to explore the concepts before they can even begin to translate them into *practicable* classroom strategies, part of their experienced professional repertoire, with any degree of confidence.

The feature that distinguished Teachers' Cycles C and D was this emerging confidence in *applying* the concepts, experimenting with strategies, and methods for integrating these approaches into planning and management of learning.

Everyone reported some success and progress with implementing aspects of the CILL pedagogy:

T 1: But when I sat down with groups and got involved in co-coaching, it's been stimulating, rewarding, interesting... because what I'm saying is, "Investigate the notion of X and here are some areas you can think about like processes, outcomes, principles, ideas, and that sort of thing." And most of them have gone away and thought, "Yeah, we'd like to do this... cover this area" and some, particularly in the degree area, have come back with quite complex, which I would expect anyway, and quite rigorous sort of study questions"... Yeah, once Degree (students) realised that I needed to see them and wanted to talk through what they needed to do, it wasn't a problem. They grasped it and just did it....

The action research process, and the exploration of the elements of the 'props' was approached analytically and diagnostically. For example, this teacher adds:

T 1: But I want to try and find out more about why they did certain things or didn't do certain things, and just get their reactions and feelings and thoughts about what I'm doing, basically so I can make it better...

Another tertiary teacher is using email for proactive coaching and co-directing learning:

T 2: I've found it's made a big difference. The students are a lot happier. They know they can ask questions without any of the other students hearing what they're asking. If they think it's a stupid question it doesn't worry them. They can figure out what they're asking you, and you can consider your answers. Because, you know, sometimes with face-to-face you get sidetracked. That's one of the advantages. You can do it when it suits you and then can do it when it suits...

A secondary teacher talks about Prop 4 and formative co-evaluation with students:

T: I'm very pleased with what I did with my Year 8 group in the disasters unit... just doing little mini-sessions where they... just set out what they were to achieve very briefly in just a few lessons, and, I got the feedback from the students. We talked about what they had done that was better, a than they'd done the last time, and I feel that it was much more satisfying, to them and to me. They just felt... well, it was something that they could control, and it wasn't too big (X agrees) and they had started off with the ideas of what they had wanted to find out in the first place so they were in control from the beginning and I just found it much better. I think they did as well.

Teachers are 'sparking off' each other's ideas and strategies. It becomes clear that the Framework has been internalised and teachers iterate confidently between the 'props' and related strategies. Teachers remember and carry through others' problems and concerns like threads. Problems are being solved with reference to others' ideas and strategies. A newfound confidence replaces the Cycle A and C feeling of 'nice ideas but too hard'. Problems exist but ways can be found to overcome many of them:

T 1: What you're saying about setting up a colony on the moon. Setting up a colony in the rainforest... gave me some ideas ... something new that I thought... keeping up the motivation of the children, 'cos it's going really well...

Another primary teacher has discussed working with students to develop checklists so that they can self-monitor and self-assess their work. The researcher links to a tertiary teacher's concern

G: There may be things you need to think about (there), T 2?. Is there a bit of distancing yourself from it and just doing more pre-thinking, pre-planning and pre-designing and actually putting stuff out in the form of (T 2: mmmm) checklists and things which actually spark the sort of thinking that T 1 is talking about? ... to almost de-personalise it to 'These are things that need to be filled out'... paper's quite neutral... they don't see it as being generated by you. It's just part of the system.

T 2: Yeah, I think you're right. I think it's probably the answer to my question. I think it's the answer to my problem - yeah, as you say, develop some checklists, develop some models on paper, so they can sit down and look at it.

G: It sort of depersonalises your involvement in the process in a way, but it also makes it easier with larger classes, and stuff like that...

T 2: Yeah, and it also provides them with some guidance as well. It provides them with a crutch to lean on...

T 3: Well, T 1, I must say, I was sitting there listening to you talking going tick, tick, tick. I found, and this is going back... if I left it wide open, I found my students doing nothing. You know, they would drift from week to week, and they wouldn't actually start. One strategy in some cases I've used was actually showing them students work from previous years to get them started, to give them some idea of what you're looking for.

While tertiary teachers are still aware of the large constraints posed by timetabling, student expectations and 'normal' tertiary teaching, there is much more willingness to see these constraints as problems and to seize opportunities to embrace innovative solutions:

T: I'm actually supervising a couple of third year students who are helping me with some electronic computer-based learning for a couple of my accounting courses, so it's sort of using a variation on CILL. And I've been spending quite a bit of time in the last couple of weeks - the checklist thing that we were talking about... about trying to anticipate problems and trying to build that into the learning so that the routine stuff they can almost self-diagnose off the system, and that would free me up to do the non-typical or the difficult students - to get around this lack of time... So it's been quite good sitting back and looking at what I want the students to be able to do, and what different strategies I could possibly use to make it easy - 'cos trying to teach them accounting is NOT easy! So it's been good fun.

After three decades of reading recorded failure in resource-based learning, most recently the depressing Moore study (1998) outlined in Chapter 5 it was encouraging to hear spontaneous accounts of student success, and teachers' success in coaching the pedagogic concepts inherent in the Framework. The sense of excitement in the tapes is palpable; the prevailing sense of cynicism and 'can't do' replaced with 'can do, will do, let me work out how.' Despite the exhaustion of the illness-plagued winter terms the final session included comments like:

T 1: I don't really want to stop! It's too much fun!

(T 2: Yeah!)

T 2: Yes, I think I'm more involved than I ever was in the classroom. And I feel more focused, and it's the style of teaching that I'm really really enjoying - like ever since it started I've really enjoyed this way of teaching, whereas before it wasn't like this...

Teachers are unused to challenging the latest theories and curriculum approaches or having opportunities for sustained 'reflective conversations'. They appreciated a 'safe' context for discussion and debate. Was Cycle A/B cynicism evidence of how the barrage of administrative and curricular changes is dealt with by teachers who are unused to sustained professional debate?

T 3: But I think there's another side of it too, that people don't feel it's kind of kosher to criticise or to express their doubts about things, and that someone's going to be mortally offended by you if you do. And I've really appreciated that about you... [laughter]... I think you could have... (T2: We just throw everything at you, Gwen) been in an ivory tower and could have become mortally offended by us questioning you, but you've actually gone up in my estimation, Gwen (laughter).

The assumptions: Context, Control, Coach

Comparing the findings of Cycles 5C and 5D with Cycles 5A and 5B validated the earlier conclusion that these three theoretical assumptions could be sustained pedagogically. The retrospective NUD*IST analysis of the data (summarised in Appendix 2) provided further confirmation of the data, in Cycle 6 Teachers *could* and *did* learn to coach strategies which helped students to gain ownership and control over their own learning and demonstrate improved quantity and quality in their use of information in building and communicating knowledge. Students *could* and *did* control this learning and demonstrated enhanced self efficacy, self regulation, motivation and cognitive skills including metacognition, even within a context which is hostile (in terms of constraints of time, timetabling, resources, curriculum and teaching situation).

Context *is* massively influential. Information literacy learning is unlikely to occur if there is gross imbalance between the three assumptions. In other words, however well equipped a teacher might be to coach students to control their learning, the context might be a total barrier.

What this cycle contributed is the recognition that, while the current context provided by the tertiary and secondary learning systems might be inimical to information literacy learning, time spent in the first cycles discussing specific contextual constraints, ‘naming the enemy’, enabled teachers to translate some constraints from apparently insuperable barriers into soluble problems.

Propositions

The propositions (Appendix 3b) evolved by translating the negative findings of past studies into positive attributes, and linking them to the criteria for effective constructivist learning. Cycles 5C and 5D validated the relevance of these propositions (see also Appendix 2). In relation to each proposition, teachers produced evidence of successful teaching and learning, although not all experienced the same level of success in relation to all propositions.

Proposition 1: Information literacy learning is authenticated

Teachers liked the concept of authentication in theory, but in practice frequently dealt with it by translating it into ‘topic relevance’. In the model this proposition incorporates authenticating learning by inviting the learner to consider:

- the topic: interest, importance, relevance to personal interests, curricular/ vocational relevance;
- the learning requirements in terms of personal self efficacy, capacity to self-regulate, motivation.

While student expectations of learning (instrumental/ ‘spoonfeeding’) was seen as a possible barrier by all teachers, only four (primary) of the eight saw the need to learning by articulating the implied learning approaches and assisting students to relate these to their perceived attributes and expectations. These teachers are discussing authentication:

T 1: It's just making it relevant to the learner, isn't it?... that you've learnt somewhere else in another situation, isn't it... making linkages all the time?

T 2: They hate to feel that they haven't got a skill, or they can't do it, or they don't know it. And it is so important that they feel that they already do have some knowledge... I like to start off with... I really believe it's important to talk to the kids about, well, starting with the points you made near the end, the way that they work, the skills that you want them to use, what they're going to focus on and so

on in terms of the actual processes that they're doing in their learning and coming back to the topic... I guess I don't teach anything I don't believe in or find interesting myself - or I'll twist it round until it is a tangent that I'm personally interested in... Yes, if I'm not excited, how can I expect the kids to be excited by it?

T 3: And I think it's also knowing your kids and their abilities and interests and where they are at...

*T 2: I'm just writing a little equation here as I listen to what's being said and the main points I think have come up, that the kids have got an excitement in the subject, whether it's their initial excitement or we create an illusion of - you've got **EXCITEMENT IN THE SUBJECT**, plus **CONFIDENCE IN THEMSELVES AND THEIR SKILLS**, plus **STRUCTURE OR LEARNING FRAMEWORK**, then you've got ownership ... and they feel they can go on their own. But they've really got to have that excitement or motivation. You've got to give them those skills and the confidence they can do it...*

One of the tertiary teachers refers to the problems posed by 'adolescent' students whose instrumental attitudes are different from adults':

T: That's the other thing I notice with adults. They get a bit frustrated with stuff they can't see a need for. If you can persuade them that, like I can remember three or four years ago, it was quite interesting, there was always a lot of grumbling about having to do the communications part of the degree, and then one of the - it must have been an older guy in his 40's - went up and did the rounds of the job recruitment people in Auckland, and came back and said the first thing on the top of their list was communication. And all the students shut up! ...

So I'm not quite sure... it's one of the things I'll be pondering on over the holidays... what I can do - it's probably the authentication bit - to make them think that this subject is important and they're going to need to put some effort into it because it will give them some valuable skills for later on.

Authenticity is aligned to topic relevance and motivation:

T: Making the learning relevant is quite difficult, isn't it, especially with my children at Form 2 - things that we have to cover, or should be covering they sometimes don't see as relevant, so it's getting them motivated and trying different ways of getting them motivated is really important. I like your idea of using the detective idea of looking for different clues and putting them together. And also, I like the problem solving idea too, which is probably the same when you look at it, when you actually set them a problem and they have to find out 'Well, what information do we need to gather to solve this problem that we've got?'

Another teacher sees it closely aligned to focusing on skills as well as topic:

T: I suppose I have a heavy swing towards ... the skills as much as the learning area you're working in... if you've got a clear focus on those skills as well...

This teacher is one of two who consciously focuses on highlighting student self efficacy:

T: ... they don't really enjoy it if they're not confident in their ability to do even the most simple things. they've got to feel that they can do something at whatever their own level is.

Encouragement and input are seen as integral to authentication. An authentic learning purpose is also seen to help:

T 1: So to begin with, in the first two days, rather than just getting into the designing of their colony and what was going to be needed just for them to survive on the moon, we were spending quite a lot of our 1.5 hours... just reading out and I did quite a bit of reading to them from which they could get bits and pieces of information that might give them ideas for establishing their colony... it's been very interesting, and the other kids who are out of the room are getting quite intrigued by what the kids are coming up with...

T 2: The BOT (Board of Trustees) wanted something for the 25 year anniversary celebrations we're having in December. I've been harping on at them about doing up the front entrance. It's really an eyesore, and someone said "What about you and your class taking it over?" So I went to the children and said, "Look, we've been given this task. how do we go about finding out what we need to know so we can plan the garden?" And so we came up with a whole list of ideas, and then we went and looked at the area, and sort of visualised where things could go. Then I said to them, "Well, you know, do we need some help?" and they said "Yes, well, we need some help." So we went through a whole list of people, and they went away and contacted some people, a landscape designer and a nurseryman, and organised the landscape designer to come and talk to them about how to go and plan a garden. When he'd come and talked to them and they'd asked him lots of questions which I found... the questioning got better and better as they needed to find out more and more, as they narrowed it down to what they really wanted.

G: Brainstorming and mapping?...

T 2: Yes, the kids are really used to it. In fact they brainstorm everything now and categorise it and give it labels... yeah.. .and went to the nurseryman and he talked to them about different types of plants, and he asked them questions and they sort of responded, and then they had a look at different plants and read labels, and looked at costings and things like that, and then I got a whole lot of books from the library in Thames here, on gardens and garden design and they looked through those...

The Friday before they had to get their drawings in they were ringing up for quotes - it was just amazing - I just sat there chuckling to myself "I wish Gwen was here" (laughter)...

This example shows how closely authentication is seen to relate closely to Prop. 2.

Proposition 2: Prior knowledge is established

T 1: ..we're looking at pioneers of NZ, particularly the Taranaki area - they actually did a reasonable amount of reading, picture discussion work and so on... they actually had quite a little bank of knowledge building up before we actually began the structure of the unit... and I've found that this has worked well.

The kids seem to be really motivated in a more deep way... they were interested because it intrigued them and it was totally different. I'm feeling that this is a bit more genuine. They are coming up with questions and ideas and when they're reading, I look up from what I'm reading, and there are 6 kids busting to show me something... They really are genuinely delighting in what they are finding out...

The researcher suggests "the key thing about Prop 2 is really making links - making links to that prior knowledge and making links to their curiosity" and asks what strategies teachers use.

T 1: Well, I just use brainstorming a lot, Gwen, now that I've learnt about it. And I just find that every child feels really valued in the class. Whatever they say is accepted. And they do know something, even the slower learners, and then we go round sharing what we know, and they can add to that as well, so they see their

knowledge actually growing, they actually know things - and it leads onto the questions so that they can go onto locating information later on.

T 2: I think the sharing is a pretty vital part of it, isn't it. You know, if you send them off on their own, and "Gee, I've only got three things, and he's got half a page" and, especially if you work with your whole class together for brainstorming which I do quite a bit (T 1 agreeing) because I've got ... the lower level of a lot of the children, that they're not hung up at all... they're not comparing themselves so much to all of the ideas of some of the more able children, and it really fosters that... aspect. It really sparks them up. They have got that contribution there...

T 1: It also gives you an idea of where the children are at too, and whether you can lead them into different paths, or whether they can take you into different paths that you haven't thought of...

T 3... I should try a bit more mindmapping stuff, yeah, cos I really like it. I've used it as an assessment technique. Like at the end of the process I've given them you know, word maps, or asked them to draw mind maps as a follow up, but I've never actually done it as a beginning activity which is an intriguing thought. I'd like to give it a go.

T 4: I often get the kids to think on their own first, and jot down everything, because I think some kids sit back and let the talkers do the talking. So I say "Think about it; write it down." My kids have, well, I call it a planning book where we do a lot of mind mapping and pre-thinking and pre-planning. So I get them to do their thing and then I say "Pair up and talk about it, and what have you got and what has your partner got?" and then share that with the big group. So I'm trying to get everyone to be accountable for their own thinking before we feed it back, because I find that there are some kids who will sit back and just let the thinkers and the talkers put it all forward.

T 2: ...yes, we use (brainstorming) for a lot of things really, in a variety of ways... even used it in music - we're writing our own simple tunes and things like that. I try to keep it going I guess because I'm just trying to convince a lot of my kids still that, hey, there is something in your head and you can contribute and write down (T1 agreeing) if you try. It's a lot of building up of confidence (T1 agreeing) with a lot of children in my room. Other classes we do it a lot more individually...

T 2: The grouping of the ideas? We call it mapping. Some kids like to do it as bubbles, and I think it just helps them focus their thinking before they focus in because I think the making the questions is, for my kids anyway, the hardest part really. They're pretty happy with everything there and they are feeling a lot more happy with the latter props, but, yes, probably the bit that I still feel most anxious about is setting the questions.

The researcher reinforces the link between mapping existing and emerging knowledge and Prop. 4, defining knowledge needs:

G: For me, having the map, and being able to get the students to ask specific questions in relation to specific categories of the map is key... It's not just A question looking for AN answer.

Questions relate, in turn, to Prop 3, the crucial concept of owning the learning and being able to control it.

Proposition 3: Ownership of learning is established**Proposition 4: Knowledge needs are established**

These propositions are discussed together because most teachers saw them as mutually inclusive, although the researcher does not. The prevalent assumption was that having students devise questions would ensure ownership of the learning.

Several teachers saw links between ownership of learning and prior knowledge:

T: If the learning is going to work, it has to be hooked into something they know. It has to be hooked into their own experience and they have to own what they're doing. Otherwise it's just not going to work. They're just going to go through the motions.

Only primary teachers mentioned involving students in planning and monitoring their own learning:

T: I like it to have, components, I suppose of quite open-ended learning where kids have a lot of input into what they're going to do and how they're going to do it, and in their assessment, but, um... When I was looking at that map, I very consciously went through those early strategies, and thought about, OK, you children have to think about your own particular research problem, and got them to do a lot of thinking about how they were going to access information, how they were going to put their whole plan together, and I made them record that and check in with me, and we also put other checkpoints in. The difficulty, I suppose, 'cos they all had something different, and that makes it huge 'cos you can't bring groups of them together, so you have to have individual conferencing, but, yeah, that was very very much child-centred, and I taught, if you like, skills on need as it was required... It gave me a lot of knowledge about the kids and how they operated, yeah.

Likewise, the choice dimension of Prop 3 was suddenly recognised as one of the telling differences between primary, secondary and tertiary, and seen as one possible explanation for students' lack of ownership and attitude to learning. This, in turn, was related to the idea that relevance is not just a question of the topic - it's the degree of abstractness with which it is presented.

T 1: Primary love to know and love to find out because it's a whole new realm of them having control over this big adult world and I've just written 'primary kids LOVE to know; secondary kids NEED to know' ...

T 2: It's a control thing. At primary it's a lot more open. They're investigating; they're finding out. There's a lot more scope for freedom whereas at our level, at tertiary level, and I daresay secondary level and that's where it starts, they are told "you are learning this you are learning that you are learning... and this is the way you will learn it" and they lose the spark; they lose the desire to find out stuff...

T 3: I'm a little uncertain about that. I'm teaching a human biology class at Yr 11 - very factual base; a lot of memorisation, and those kids are really sparking. There are things that they can remember. It's just total acquisition of knowledge...

T 4: Bodies a big part when you're a teenager!

T 3: I think a lot of the learning they're doing at secondary school is a bit structureless. They're dealing with very abstract concepts - we deal with in social studies, same with English, and I just think some of them aren't mature enough mentally and I think they just get lost.

G: Does relevance mean such different things at different ages that it's almost a meaningless term? (Refers back to X's comments when her students were trying to define the essay topic on their rights. That should have been relevant to them but they had a lot of difficulty. Was it too abstract to be relevant?)

T 4: They don't have a lot of knowledge to base their abstract ideas on and another example would be map work. Children really get excited at the secondary level about doing maps and finding out where places are, and... We just don't teach like this any more. If I want to get a class interested in something I give them rivers to know, places to know, continents and oceans... and they do get very enthusiastic about that...

T 5: Because I do a lot in the accounting area and business management things I find great difficulty with 17 and 18 year olds trying to get them to relate to business because... they have not had part-time jobs; they don't know what I'm talking about, and this is very very abstract... at first year in terms of business context most of them haven't got a clue what I'm talking about. So yes, you do have to....

T 6: Yes, responsibility to be a resource bank for them if nothing else... (T 5 agrees), but not necessarily give them the answers.

When authentic topic, purpose and audience, timing, choice, coaching and guidance come together, the result is powerful:

T: Yes, and they're going to see something by the 16th December, you know. Ah, and three boys - and it's BOYS too that are taking this on, 'cos usually they're more reluctant than girls I've found in my room - and they are going to the Board (of Trustees) tomorrow night and they're going to go through what they did, the process, and also present all the costing.

G: So how come it's those boys?

T: Because they chose... They were really keen and... before anyone else could get in. And I thought, Wow! I'm not going to stop this... 'cos usually we look at who would like to do it. But they actually came forward and normally - they're very bright boys - but they usually just sit back and need a gentle push. But they were actually quite excited and, yes, they'll come to the Board, and, yes, they'll talk to the Board about the start and how they went out and did it. I was really rapt, cos the girls in my room are sort of more outgoing and dominate the boys, and, yeah, this is where they were shining.

The data nodes with the single largest number of entries (over 100) relate, in the negative, to the affective dimension of Prop.3 - how older students feel about learning, feel about themselves as learners, their model and expectations of learning and teaching.

T 1: I think it's motivation, actually. To me, the desire to know, the desire to learn, the motivation, and, I think having the skills in the first place. I contrast my top degree students to my middle to bottom diploma students, and I say contrast as opposed to compare because there is a dramatic contrast between them. Because those students at the top level of the degree - in fact all my degree students want to learn - and they are motivated - ah, no, that's not quite true... Some of them are only there for the pass, but the top ones are definitely there to learn, and they succeed, and they excel, and we look at... and my diploma students at the bottom level just do not have the skills. I'm having to fail students for this particular paper on the strength of their inability to write, to communicate their thinking on paper... it's just constructing basic paragraphs of stuff and they just do not have the ability to construct knowledge.

This contrast between students with adult and 'adolescent' attitudes remains a frequent tertiary theme in these cycles:

T 2: I keep saying to them, "One of my goals is... between three and five years down the track you're going to be put in the position where you've never seen this thing before, and you're going to have to be able to solve a problem. And we can't give you the answers 'cos the answers don't exist at the present point in time. And we want you to have the confidence in yourself to go in and tackle this problem." And it's very hard for them to get out of the model answer black/ white ... I get frustrated ... (laughing) when, as you say, it's not... they're just reacting to how they've been taught the last 3 years or whatever ... when you've had adults who've worked for a while, they realise that there aren't model answers...

While many of these comments relate to secondary and tertiary levels, teacher-dependency and desire to be spoonfed are also evident in primary students.

T 1: Some of them are quite happy for you to give an answer. They don't want to have to do the thinking.

T 2: And we can sustain ourselves toward a long term goal whereas kids need pretty instant feedback, don't they, along the way? If they've got to wait too long, then they quickly drop off, whereas as adults we can sustain ourselves for weeks or fortnights, or years! (laughter)

One teacher has been away and notes that skills she thought had 'stuck' have disappeared:

T: I think they still need a lot of that guidance. I was very interested. I was just checking through a girl's draft copy book tonight... and found a whole lot of notes that she'd recorded doing a so-called project on ghosts while I was away... she's got about 9 pages, and it's all just copied out of a book. And I thought that that shows that she's just doing it; hasn't set herself a target; hasn't applied any of the skills that we've worked on all year; that, without that direction or control or guidance or whatever, she's reverted straight back into that "I'm doing a project on ghosts" and the pictures are just traced out of a book, and the notes are just copied out of a book word for word...

G: I just think that kids are very good at giving teachers what they want [agreement]... I mean, basically, the teacher who came along after you triggered the project mode and they were very flexible and jumped back into it (laughter).

T: And it keeps them busy because they just sat there and copied (agreement and laughter), and in particular about this girl: "Oh, she's been working so well while you were away!" And I thought, "Yeah, well, she certainly has been copying out of a book all day!"

This teacher has found the concepts of Prop.3 an aid in analysis and affirmation of practice related to student self-efficacy and confidence:

T: I think it is demanding on them but it's a positive demanding; it's a challenging demand, and I think for the learning to be successful you've got to make demands of them otherwise they're not going to step forwards. It's demanding on them to try new skills, and to master new skills and to put new skills into practice from their own decision making. You know, they decide when to use that skill and they'll decide how to use it to best effect... new skills to approach things from a different way from what they've been used to ... demands in terms of the fact that it's a challenging way of learning. Yes, I guess I'd be disappointed if it didn't make demands on the children...

Ironically, as illustrated by the successful examples, ‘answers’ to the problems (Prop. 3) of lack of ownership, lack of self-efficacy and self-regulation, may lie in coaching strategies related to Prop. 4 - mapping of knowledge, and derivation, from the map of ‘the keys’, key questions, key ideas or concepts and key search terms. Teachers did not see the link.

Only two teachers, the teacher-librarian graduate and the primary teacher who was simultaneously completing the ‘Infolink’ course, made explicit and successful use of the keys framework discussed in Cycles 5A and 5B as a tool for focusing the questions students framed. There were some 28 references to the inadequacy of students’ questions, their inability to keep focused on the questions and the inflexibility with which they applied questions, expecting AN answer to THE question to pop out, ready formed, from the information source. Most teachers seemed to see quality of questions as related to ‘ownership’ and ‘motivation’. For the researcher to have demonstrated the power of ‘the keys’ would have been a more direct teaching intervention than the role warranted. Nevertheless, some progress is recorded when (on one of two recorded occasions) ‘the keys’ are used:

T: They had to set up 5 of their own questions... we did do some class brainstorming first after we’d looked at the series of three or four lessons of picture discussions and group discussions over pictures, so they had been fed a reasonable diet of building up a reasonable diet of... a little bit of pre-knowledge, I guess. Then we did some brainstorming together; “what do we know about the pioneers?”, so it was really them feeding back what they’d already picked up from the picture discussions for most of the kids because they didn’t have much prior knowledge before I’d begun the unit. And then that’s where they stopped after that brainstorming, and the next day they had to think “what do you want to find out on our trip to the Pioneer Village on Wednesday?” And they came up with some really interesting questions and a very wide range of questions... most of them didn’t have the same degree of difficulty setting questions as what they had earlier on, you know, last term, and earlier on in the year when we first started.

Proposition 5: Selection of information is coached

Proposition 6: Analysis of information is coached

Proposition 7: Construction of knowledge from information is coached

Proposition 8: Communication of knowledge is coached

Again, teachers’ responses to these propositions are discussed together because teachers, on the whole, saw them as mutually inclusive. Again, negative observations on inadequate student performance and skills outweighed positive comments, but progress was noted.

In retrospect, one of the most obvious insights emerged by default - that success in the construction and communication of knowledge (Props 7 and 8) can be predicted from the extent to which Props 2 and 4 (helping learners to establish prior knowledge and define knowledge needs) are explicitly *structured* in a way that *learners* can ‘own’ and use as a tool for selection, and analysis of information. This is expanded in Chapter 9.

It is clear (from four primary ‘complete’ CILL units) that where teachers focused all or most of the elements described under each ‘prop’, the process had a coherence *for the students* which resulted in qualitatively better work (better use of information sources, better use of thinking skills in analysing information to construct knowledge, better focused communication of that knowledge). All of these ‘case study’ units were intensively coached and monitored. For example, a primary teacher demonstrates an ability as ‘coach’ to iterate round the ‘props’, to ‘design learning in action’, selecting and keeping the significant elements of the ‘props’ in mind to guide the planning/designing of the learning, setting students up for success, using direct and indirect coaching, planned ongoing monitoring and co-evaluation of students’ learning process and product.

T 1: The ownership of their learning is what I'm really working on. And getting a real purpose. So, we found this program called Hyperstudio for Apple Mac. I've been away learning to use that, and the kids got quite rapt in how they could present their work to their parents using the multimedia and...

T 2: And it's actually quite easy for the kids to use and a very good way of presenting; an exciting way of presenting...

T 1: I've been focusing too on how, as a teacher, I can actually coach the children, you know, a lot of modelling and demonstrating and using your prompts on page 5 - how you're going to do it, how you're going to - explain how you're going to do it, and that's getting their thinking going really well. Also, making sure I've got plenty of resources for them because... so that the information that they need is there... so that they don't get all frustrated, you know "We can't find it." Also, relating back to the questions we've developed at the beginning of the unit, and also I've started these checklist charts, like at the beginning of the session we look at "What are we looking at today?" "Have you designed search words to locate the information?" Then reading and discussing their findings, and then brainstorming what they have discovered, and then mindmapping... information under category headings, and then thinking about other questions that they could perhaps use for the next day... That's just really getting them to take ownership of their learning and to keep thinking beyond when, you know, I'm not there...

Recent New Zealand research (Crooks & Flockton, 1998) indicates that many New Zealand primary children have difficulty retrieving (print or electronic) information in libraries, but far more difficulty selecting and understanding relevant information in the resources retrieved. There is some indication here that when the elements related to Props 3, 4 and 5 have been coached, and the students 'own' them, they experience less difficulty than the 3,000 Yr 4,8 (ages 8, 12) 'NEMP' sample (ibid., p. 12).

T 3: ...then asked them how they'd got on getting extra information from other sources of their own. And that was really interesting.... more than... I'd actually realised just talking to kids one at a time about what they'd found... did it with the whole class. 13 kids had got extra info. from books at home and 9 of them from encyclopaedias, which really surprised me 'cos I felt a lot of our kids didn't actually have many of those sorts of resources at home. But they'd either gone to home or next door and looked up encyclopaedias. 8 kids had got info. from just taking to their parents, 9 from the radio - and this was when we were taking about the Mir Space Station...

G: Your previous comments about parents, X... That's probably a better...

T 3:... I was really surprised. 8 kids out of the 20 had gone to the library which is a really good response ...the public library... Yes, there's two or three girls that actually club together and go with one mum. And a couple of kids had used the bus library... 8 kids had looked at the newspaper - once we got them going on the Mir Station... and a couple had used that and the other 6 from home. 7 kids had looked up the computer; 2 had used Internet; 1 had used an encyclopaedia program; 1 had used Windows; 1 had used Encarta; 1 had used Compton's Encyclopaedia; 1 had a program called Space Explore and another had got onto the Web, and they were a little bit vague because they'd got Mum to help them and they weren't sure exactly what she'd done to get in. And another child had used the Space Travellers Guide on the Internet.

So that really surprised me as well - I thought gosh, here's me thinking there's nothing there... I'm really quite enthused by this... I'd been, perhaps, a bit light on really pushing research for homework feeling that a lot of them didn't have the resources...

The main thing that they found most difficult... They said, "We know how to find the information and we can get lots of notes, but it's when we actually write it up. It's hard to know which notes to actually write down and which to leave out." So we've been working on that in reading/ language time over the last week... The other day I read them a book... and said, "You've got to pick out 3 to 4 facts..." They're just writing that up now and doing quite well, and learning to actually cut down... They are doing really well with their collecting notes... they're actually writing them down in a more shorthand form and learning not to try and write whole sentences or even phrases... and going back to it a couple of days later and seeing whether they can still make sense of it.

The skills needed to help students to find information were seen as within the capabilities of the classroom teacher. The tertiary teachers mentioned librarians who were willing and able to help students. One secondary teacher saw a problem with the logistics of single-handedly helping so many students find information, but suggested a teacher aide as a solution. One teacher sent students to the library to use the Internet where help was available from a part-time untrained person. Library skills were not considered particularly important, or particularly lacking.

Of far more concern, in both cycles, was the issue of finding resources at the right level, the difficulty posed by Encarta, and of finding time to bookmark Internet sites to prevent 'endless cyberspace surfing'. 'Tech-savvy' teachers clearly considered finding and bookmarking sites well within their competence and role. This challenges Kuhlthau's (1993a) assertion that successful 'constructivist' resource-based learning requires librarians as well as specialist reading teachers working alongside classroom teachers.

Another persistent concern was student's willingness to get sidetracked into interesting but 'irrelevant' information, and the difficulty of keeping students focused on their questions. 'Self talk' (see comments above) and 'writing it in your own words' were seen as good strategies for transforming information into knowledge. One teacher was obviously comfortable using devices like fish diagrams. Again, the failure to collate, synthesise and interpret information was mentioned frequently, but, when the earlier stages had been thoroughly coached, this became less of an issue (see quote above).

Another issue which was raised at all levels was students' reading ability. This reinforces the NEMP (Crooks & Flockton, 1998) finding that, while Year 4/ 8 students might have been able to read the words, they had difficulty reading for meaning. Again, with coaching, even lower ability primary children demonstrated less difficulty:

T: I thought, yeah, we're doing pretty well really with the level of kids actually using information... they were getting really quite good at narrowing down, cutting out the flossy bits, the unnecessaries, and I thought, yeah we've done pretty well at that, so ... let's have a look ... further back... setting the questions.

Proposition 9: Pro-active teaching runs through Props 1 - 8

As illustrated above, proactive teaching, which came to be called coaching, achieved excellent results at all levels. While, in Cycles 5A and B, the value of coaching was discussed, it was only in Cycles 5C and D that the results became evident, particularly with three primary teachers. What became evident was how they were working flexibly *within* contextual constraints - curriculum, timetabling, interruptions. They worked around obstacles, demonstrating an implicit grasp of the conceptual assumptions; coaching and monitoring with assurance:

T: I've been using those steps to try and get that whole attitude of... challenging themselves... I've felt more relaxed in taking particular parts of the framework and working focusing on one particular part and not worrying so much if we don't

really follow right through the whole sequence as I've felt one should... a big emphasis on children's own evaluation. They do it orally. They've had to give short comments and evaluations on some of the work they put into their portfolio, or they've just made a comment on how they felt they were going with notetaking skills - things like that - so we've still got quite a lot of work to do on the last props, on their own evaluating, and evaluating each other.

Proposition 10: Co-evaluation runs through Props 1 - 8

Strategies for co-evaluation and self-assessment emerges as a strong thread in Cycles 5C and D. One teacher describes her success with peer assessment:

T: They came up with those key research questions like 'Give a physical description; what's its habitat, what are some of its adaptations... and food?' We were really looking at the ecosystem there. I said, "OK you've identified those. You've gone and done your research and your reading, your CD Rom, etc. You are now going to share it back as a report to the class, and we're going to peer assess, so we want to know that you've met those criteria."

... a lot of the children who have given their oral report have gone away and added to that information based on the critiques, if you like, and also, it's made the others really focus ...

G: So as a result of the critique they are still able to go away and amend it?

T: Yes, and then hand me in their final product. So it sort of evolved. It wasn't intended that way but that's the way it's evolved... they're taking it, I thought, incredibly maturely. They stand there and they listen to the critique because I said they must have a positive comment first, and then give a comment about how they could perhaps improve, and do they need to add something, is there something that you think is missing?

G: When you say criteria, did you actually discuss what made it good, what ...

T: Yeah, it's all linked back to those research questions... It has to be in relation to those key research questions they came up with. So I kept it quite tight, and so, what they have listened for is really have they answered the question, have they got the information, and is it full, detailed information? Some of them, a lot of them, found it difficult to come to terms with adaptation and didn't quite know how to research that because it's often not written in black and white and they've got to do a little bit of thinking. Like, OK, the piranha obviously has an adaptation of its very sharp teeth because it's a flesh eating animal and it's got to be able to feed in the water... so they had to think quite critically about that, and that was probably the hardest part for them.

The teacher who works in the lowest decile school, whose class has some very low ability students (PAT results), discusses students' summative self-evaluation:

T: It was actually the comments that I got from all of the kids afterwards - I collected all their individual comments, so I'll give those to you at the end - because it actually gave a real insight into why they felt they'd done pretty well.

Insights into the nature of student learning deepened significantly through the action research process. This cannot, obviously, be attributed solely to the use of the CILL Framework, but it was one of the gratifying results of *focused* 'reflective conversations' over a significant period of time which has implications for teacher development. Teachers are now looking differently and seeing the interactivity of control and coaching differently:

T 1: I've been surprised by some children with quite low ability who really enjoyed this approach, who find it challenging 'cos they can prove themselves in their own way, and particularly with the boys this is very important...

T 2: I've noticed some of the boys in my room are fiercely stubborn about really trying to do their best without anyone else being aware of it, or hiding what they're doing, but seeking your approval... In particular two boys. One is a Maori boy. He's difficult at times... had a lot of help with anger management and so on...

But now he's accepting pleasure from, say, managing to write out his 2x table and quietly coming up and showing me, whereas before he'd just shove his maths book in his desk and skedaddle out the door as quick as he could... He knows he's no good at writing things down. His writing is really only about a 6 year old level, but the questions he keeps finding... his observation powers and what he was able to tell me..., and X, the language teacher, was there as well and she said, "Yes, I noticed the same", and now he's wanting to share all that and get it down in writing even though it's really hard for him.... He's enjoying the challenge of it. I suppose it is a very big demand on him.

I've been surprised. I really didn't think that this approach would work that well with my kids, and I've realised, hey it can, and perhaps it caters for the wider range of ability more readily, perhaps, than some other approaches - than traditional approaches if you like.

The unstructured interview raises the issue of the extent to which student attitudes to learning may be shaped by our constant demands for them to write:

T: ... and she said, "I read that book, and I found it so boring".... "How do you keep the kids interested?" And I thought, mmm, these kids are lapping it up. It never occurred to me it could be boring... I mean it comes from the kids as well... perhaps the picture discussions were something different that really got them going in a different way. I got excited by what they fed back.... I was really excited, so we said, "Oh, you've made a really good generalisation" and we talked about these new things they were doing. They were making generalisations and making deductions and... I said, "Look we're not going to do a lot of written work . We're going to do a lot of listening and talking and thinking, because all I want you to do at the end of this unit is to know and understand how they lived", and I think that has sort of taken the pressure off...

So I think perhaps that that might have helped them be positive - that I said at the beginning this is going to be something where you're going to really learn by listening and looking. And they enjoyed it. They know we've had the first two terms heavily dominated by oral language... So I think that's helped some kids 'cos they worry, if I learn this, I'm going to have to write it down. If I know this or if I do this, I've got to write a story about it!

G: ...we've embedded in them this model of learning which is so very much 'regurgitate in writing'?

T: ... they're going on a trip and one girl actually said, "No I don't want to go." I questioned her quietly on her own and she said, "I don't want to write up about it."

G: So, it seems to me one of the things you've been doing is sanctioning an almost, a broader view of learning for them, and a view of learning which embraces the notion of thinking, discussing, analysing?

T: ...when I looked in particular at the children I had this year ... a lot of them have got difficult homes, and I know that they're not going to have much of a career... these kids are going to survive in this world by thinking and speaking, not by writing. These kids are going to be out into the practical side of life, and I think the way they can speak and the way they can think and sort things out is the foremost

skill for them... I look at some of the special needs girls and think, if you are able to speak your thoughts and sort things out in your head and say them logically, if you can think about something and come up with a sentence as an answer, that's going to help you in the type of world you're going to be facing.

Use and value of the Framework and the action research process:

In terms of 'letting the data speak', the task for the researcher became much more difficult as only long excerpts from the recurrent narratives seemed to do justice to the increased complexity and richness of teacher reflection during these cycles.

In all six semi-structured interviews (Appendix 6) teachers confirmed that:

- they had benefited from the use of the framework;
- they would continue to use it to focus their thinking and planning;
- they wanted to see it made available in some format for other teachers;
- they wanted to see props for students expanded;
- they had become more focused and more able to diagnose student learning strengths, weaknesses and needs;
- they had a wider repertoire of strategies for coaching the learning-to-learn skills that they all saw as integral to effective information literacy (and other) learning;
- they had more confidence in themselves as teachers;
- they had found the process professionally reassuring and enriching;
- they had benefited from each other's contribution and, across levels, listening to each other had sparked ideas;
- they had expanded and deepened their theories-in-action and pedagogical knowledge, and their understanding of how *and why* students learn;
- they felt that they could *and had*, at least in part, overcome some of the contextual constraints they had identified, although this was significantly less for the secondary and tertiary teachers.

One teacher's final comment illustrates this:

T: It's probably given me a structure, Gwen, where I've sort of, I guess, intuitively... did these things 'cos you know that this gives kids ownership. So it was quite nice to have it all laid out in your framework for me. I could say, "Yeah, that's what I was doing when I was doing such and such, or, yeah, that's where I was going when I was looking at something else." So it's probably mapped the territory for me... but also to make me focus more on certain areas, and I guess, thinking more about strategies for helping kids, um, as well as access information... organise information, you know... I guess it made me think what else can I do to help them sort their information, bring it together, collate it?

The action research cycles with teachers were powerful validation of the faith Stenhouse and Elliott had in teachers as researchers, and a welcome balance to the negative picture of New Zealand teachers painted by Moore (1989; 1995; 1997a; 1997b; 1998; 1999). It confirmed that, initially, they lacked the skills for teaching the cognitive dimension of information literacy learning. Using the Framework processes and tools they demonstrated significant gains, and had the skills to translate it into effective classroom practice. The process was rigorous and demanding for teachers and researcher alike, but, it yielded a rich database of insight and understanding which has barely been tapped in this chapters. It will be analysed more rigorously in Chapter 9.