APPENDICES

APPENDIX 1

ANALYSIS OF RBL STUDIES* *no attempt at exhaustivity; attempt to establish patterns, recommendations, needs*

R = RECOMMENATIONS

RBL STUDIES: problems and needs	Relating constructivist principles	If the negatives were positives it would mean...
Linking/ motivating/ authenticating: Tallman (1995) R, Callison (1986) R, Rankin (1992) R, Sanger (1989, p. 112) R, Thomson & Meek (1985, p. 112) R. **No evidence:** Carter & Monaco (1987), Irving (1983), Hounsell & Martin (1983), Sanger (1989) Irving (1990), Moore (1995), Johnson (1990), Streatfield & Markless (1994), Rowbottom, Payne & Cronin (1983), Kuhlthau (1988) **Background knowledge:** Irving (1982, p. 89) - did not give students enough, so they did their own research, Irving & Snape (1979), R, Haycock (1995) R, Tabberer (1987)R, Rankin (1992) R R, Winkworth (1977) R, Thomson & Meek (1985) R, Todd (1992/3) R, Sanger, 1989 R **No evidence:** Moore (1995), Hounsell & Martin (1983), Irving (1990), Kuhlthau (1988), Johnson (1990), etc **Purpose:** Todd (1992, p. 27) - needed purpose R Rankin (1992) R, Purvis & Styles in Styles (1993) R, Hopkins (1987, p. 88) R, Irving (1985), p. 25 R, Brake (1985, p. 10), Irving & Snape (1979) R, Sanger (1989, p. 112) R, Thomson & Meek (1985) R, Tabberer (1987) R, Rudduck & Hopkins (1984) **No evidence:** Marland (Ed.) (1990), Streatfield & Markless (1994), Rudduck & Hopkins (1984), Sanger (1989), Thomson & Meek (1985), Tabberer (1987), Moore (1995), Hounsell & Martin (1983),Irving (1990), Kuhlthau (1988), Johnson (1990). **Projects / RBL retrospectively seen as ineffective for students and difficult for teachers and students:** Hall (1985, p. 16), Hertfordshite (1986, p. 6), Thomson & Meek (1985), Tabberer (1987), Marland (1987) "Pedagogic rigour needed", Irving & Snape (1979, p. 6), Streatfield & Markless (1994) - projects as "invisible learning", Brake (1985, p. 7)- challenges that "all learning of information skills must be inquiry-based", Sanger (1989), Winkworth (1977), Galpin & Schilling, 1988, Griffin (1983). **Dichotomy between information retrieval and analysis/ reflection (also portrayed as dichotomous roles between teacher and librarian:** Bullock Report, Valentine & Nelson (1988, p. 49), Hopkins, 1987, Thomson & Meek (1985), Heeks (1989), Irving & Snape (1979, p. 17), Markless & Streatfield (1994), Brake (1985, p. 33), Winkworth (1977) **Conflict between RBL and exam expectations:** Thomson & Meek (1985, p. 7), Brake (1985, p, 29), Hounsell & Martin (1983), Rudduck & Hopkins (1984, p. 17, 25) **Framing task/ overview/ purpose:** Sanger (1987) - tried but rejected by students Herring, Williams & Bain (1987) - tried but students wanted to get onto finding info. Tabberer (1987, p. 7) R Morris & Stewart-Dore (1984) R, Sharples (1989), p. 45) R, NCET (1989), Irving (1983) R - talking about assignments as 'blind hurdles', Weisburg & Toor (1995) R, Winkworth (1977) R, Sanger (1989, p. 112 R, Thomson & Meek (1985, p. 112) R - talk about rush to library as soon as topic is defined. **Need for students to own criteria:** Irving, (1983, p. 10) R Torbe & Medway (1981, p. 137) - can't find because topic is not defined, Winkworth (1977) R **Students found selection difficult:** Meek (1991, p. 25), Tabberer (1987), Thomson & Meek (1985), Moore & St George (1989), Irving (1990, p. 91),Rudduck & Hopkins (1984, p.51) **limited transfer from library/ information skills instruction,** eg Brake (1985), Irving (1985, p. 3), Thomson & Meek (1985), Todd (1995, p. 40), Lincoln (1987, p. 68), Kuhlthau (1987, p. 23), Moore & St George (1989), Winkworth (1977), Hopkins (1987), **focus on teaching 'parts of a book'**, not intellectual foundations (Irving & Snape, 1979, p. 5), Fox (1980, p. 15) - librarians see info. as disembodied from subject, **students' difficulties using libraries and books,** Lunzer & Gardner (1979), Southgate (1981), Rowbottom (1982), Heather (1984), HMI (1989), Webb (1987), Heather (1984), Griffin (1983), Tabberer (1987), Streatfield & Markless (1994), Thomson & Meek (1985), Valentine & Nelson (1988), **need to link info. purpose to selecting info, eg** Tabberer (1987), Bell (1984)- students demonstrated frustration because it took time, Haycock (1992, p. 13) - students prefer online catalogue even if they find it difficult.	None of the studies demonstrated or recommended authenticating the learning in terms of student *learning,* self-efficacy or self-regulation Some recommended (little evidence demonstrated in studies) linking to curriculum objectives and prior knowledge, but ALL interpreted planning as co-operative planning between teacher'librarian/ library media specialist and classroom teacher of *lessons,* resources and approaches. No evidence of authenticating learning for the *learner;* most started at the point of 'looking it up' Remarkable consensus on the *need* for a purpose for the learning, but, again, little evidence in studies of *student* need to own purpose. Thomson & Meek (1985) give pupils' view but ONLY Celeste McNicholas, Todd's co-researcher, shows overt attempts in areas related to Props 1 - 3. **Very little evidence of anyone showing students how to shape questions.** Just assumed that they would be able to go from teacher-defined purpose to precise information. Scathing remarks (by librarians) about teachers not knowing anything about finding information in libraries, but lots of evidence (also from librarians) that 'library lessons' and library 'user education' was seldom applied and was often irrelevant to classroom purposes in focusing on bibliographic aspects. Only Thomson & Meek (1985) and Tabberer (1987) explore reasons why in more depth. There are a number of comments about dichotomous view of roles - librarians did 'library skills', teachers 'did' (but often didn't) 'study skills', and this was seen by many to be counterproductive of progress in improving student learning, cf Thomson & Meek, Tabberer, Hopkins, Rudduck & Hopkins, Sanger. **EVERY** study commented in some way that **students needed to make more deeper, more analytical use of information,** but only a few made recommen-dations as to how (listed). There was NO evidence of any proactive or formative teaching or coaching of relevant skills, and evaluation seemed to be retro-spective and based more on perceived students behaviours and outcomes than curriculum-derived criteria (again Todd/ McNicholas work an exception - *continued overleaf*	**HELPING TO AUTHENTICATE LEARNING BY:** • **making links to curriculum learning** • **making links to self-as-learner - skills, competencies, practice** • **making links to purpose/ audience** • **making links to curiosity/ need to know, to expand knowlege** **HELPING TO ESTABLISH PRIOR KNOWLEDGE BY:** • **brainstorming of topic** • **mapping/ framing/ linking** • **discussion and input** **HELPING LEARNERS TO ESTABLISH OWNERSHIP OF LEARNING?** • **negotiate goals, purpose, audience, roles** • **negotiate plans, deadlines, checkpoints** • **negotiate criteria for process and product** **HELPING LEARNERS TO DEFINE KNOWLEDGE NEEDS?** • **focus questions - key concepts, terms, questions** • **define knowledge needs in relation to curriculum objectives** **COACHING SELECTION OF INFORMATION** • **determine appropriate information sources, information technologies, help** • **use of info. retrieval technologies** • **use of heuristic framework (keys)** • **use scanning and skimming** **COACHING WORKING WITH INFORMATION** • **select optimum information to match need (purpose/ audience)** • **record info selectively** • **organise it effectively** **COACHING CONSTRUCTION OF KNOWLEDGE FROM INFORMATION** • **interview information using reading, listening, viewing, thinking skills and graphic devices to analyse the info** • **metacognitive strategies - use of reflective conversations to establish key understandings, key facts, ideas, themes concepts, key opinions, premises, arguments, key causes, effects, solutions** **COACHING COMMUNICATION OF KNOWLEDGE** • **translating knowledge into clear messages related to learning purpose, assessment requirements, audience, medium and technology** • **metalearning strategies for self-regulated learning, self-efficacy, self evaluation, satisfaction, achievement** **COACHING SKILLS PRO-ACTIVELY THROUGHOUT THE PROCESS?** **EVALUATING FORMATIVELY THROUGHOUT THE PROCESS, AND EVALUATING COLLABORATIVELY WITH STUDENTS?**

Analysis of RBL studies *contd.*

RBL STUDIES: problems and trends	Relating constructivist principles	If the negatives were positives it would mean...
Teachers' lack of knowledge of how libraries work and information skills, assumptions about learning and students' ability to apply skills: eg Avann (1982/3/5), Griffin (1989, p. 24), Irving & Snape (1979), Marland (1990), Irving et al (1990), Irving (1982, 1983, 1985) Irving & Snape (1979) Tucker (1987, p. 19), Heeks (1989), Howard (1991), Juchau (1984, p.ii, 185), Tuman (1992, p. 18), Bell (1984), Streatfield & Markless (1994), Hopkins (1987), Tabberer (1987), Sanger (1989), Hounsell & Martin (1983, p. 65), Rudduck & Hopkins (1984), Rudduck (1991), Brake (1984) Norris & Sanger (1984), Thomson & Meek (1985), Butterworth (1992, p.88) **Students did not/ could not use information critically or analytically:** Brake (1984, p.7), Fox (1980), Irving (1990), Irving & Snape (1979), Kuhlthau (1988), Moore (1995). Kallenberger & Dawson (1989), Laurillard (1994), Rudduck & Hopkins (1984, p. 112), Rudduck (1991), Sanger & Norris (1984, p. 97), Meek (1991, p. 208), Carter & Monaco (1987, p. 107, Planck (1996), Tabberer (1987), Hopkins (1987), Thomson & Meek (1985), Winkworth (1977), Marland (1981), Hounsell & Martin (1983), Streatfield & Markless (1994), Beswick (1987, p. 66, 71), Lincoln (1987), Southgate (1981), Sharples (1989, Lunzer & Gardner (1979), Moore (1995), Waterhouse (1983), Lunzer (1984) **'Dichotomy' between information location and retrieval, and information analysis and synthesis:** Hopkins (1987, p.18), Tabberer (1987) talks about dichotomy between info/study skills and interpreting/ understanding, Norris & Sanger (1984), Thomson & Meek (1985), Fox (1980) - librarians see information as disembodied from subject knowledge, Best, Heyes & Taylor (1988, p. 106) - comment on failure of traditional emphasis on library to flow onto good enquiry learning - wonderful baby sitting!, Irving & Snape (1979), Rudduck & Hopkins (1984, p. 25) - talk about "accepting the teachers' questions (rather than their own) as guides to the proper routes of enquiry, and the teachers' statements as a proper representation of meaning", Sanger (1989, 294), Kinnell (1992) **Skills (for critical and analytical use of information) are not coached; What results is recycled information, not cognitively processed knowledge:** Thomson & Meek (1985, p. 121) "What students need to learn is what they need to learn about. It is to be a co-learner, a collaborator" R, Rudduck & Hopkins (1984, p. 30) - "Secondary education has a tendency to protect children from the breadth of ideas books represent. It offers easy routes through the quicksands of knowledge on the stepping stones of the teacher's mind or the textbook..." **Evaluation is not formative:** Irving & Snape (1979), Moore (1995), Carter & Monaco (1987) Todd (1997), Irving (1990) **Information skills approached unsystematically by schools:** Irving & Snape (1979), Hounsell & Ward (1983), Rudduck & Hopkins (1984), Brake (1984), Norris & Sanger (1984), Tabberer (1987) **Librarians' information skills efforts treated with apathy by classroom teachers:** Rudduck & Hopkins (1984), Carter & Monaco (1987, p. 55), Brake (1984), Norris & Sanger (1984), Thomson & Meek (1985), Markless & Streatfield (1990). **'Tyranny of exams":** Rudduck & Hopkins (1984 p. 17, 25,114), Norris & Sanger (1984, p. 98, Hounsell & Martin (1983), Thomson & Meek (1985, p.7), Brake (1985, p.29), Sanger (1989) **Tyranny of time:** Juchau (1984 p. ii), Rowbottom, Payne & Cronin (1983, p. 94), Sanger (1989), Griffin (1983), Thomson & Meek (1985), Irving (1985, p. 36, 116), Rudduck & Hopkins (1984, p. 114) **Limitations of projects as method for learning information skills/lack of explicit pedagogy:** Sanger (1989, p. 318), Streatfield & Markless (1994) Hounsell & Martin (1983), Knapp (1968), Thomson & Meek (1985, p. 100)- projects too complex & demanding, Tabberer (1987) , Marland (1987) - pedagogic rigour required, Irving & Snape (1979, p. 6), Beswick (1987) - snippet gathering, not meaning, Brake (1984), Norris & Sanger (1984), Hopkins (1987, p. 79); HMI (1989), Webb (1987), Griffin (1983), Heather (1984), Avann (1985), HMSO (1984), Williams & Herring (1986), Waterhouse (1983)	*continued* clearly set up and evidence of consideration in all areas, and some of the short case studies reported from Australia in *Access* seem to have paid more attention to authenticating learning and setting students up with better initial control). Thomson & Meek (1985, p. 121) say "What students need to learn is what they need to learn about learning. The teachers' role is more difficult than giving advice. it is to be a co-learner, a collaborator." Hopkins outlines the persistent dilemma of the ambivalent role of the teacher, "Interestingly, although the idea of training pupils to handle information was accepted as part of the teacher's professional responsi-bility, few teachers consider it as an area of curriculum worthy of special consideration" (1987, p. 65). Sanger (1989, p 112, 120) relates the issue of student control and framing, or authenticating the learning task from the point of view of the learner,m and raises another issue which dogs the body of RBL experience - the issue of TEACHER control by virtue of ownership of knowledge and epistemology, "Teachers still retain, in the main, a guardian-ship of knowedge which is further protected and made authoritative by the throttling grasp of assessment." Related to this is what Rudduck and Hopkins (1984, p. 113) describe as "images are of a rhetoric of independence, belied by didactic teaching, an instrumen-tal use of the library and a pedantic view of knowledge" - one of the insidious sub-plots which runs throughout this body of work and which is most evident in the studies of secondary students. This "compromise between dictating and lecturing" (Rudduck & Hopkins, 1984, p. 25) which is the secondary teachers' compromise they see as reinforcing a "long unbroken period of socialisation toward dependence on the teacher." Quinn (in Sanger, 1989, p. 162) says "We urgently need to look more closely at learning from learners' points of view." This was the view most frequently missing. RBL was NOT planned or conceptualised from the learners' points of view; it was firmly teacher-centred, library-centred, and provided the context for learning but little guidance. Learners were given the freedom to fail, not to learn.	There is remarkable consensus between some of the leading commentators, particularly Thomson & Meek (1985), Hopkins (1987), Tabberer(1987) and Sanger (1989) in their analysis of the problems and what is needed to improve resource-based learning. The RBL project which best shows the implementation of constructivist learning design principles in action (although they are not identified as such) is that undertaken by Todd and McNicholas. One article, Todd, Lamb & McNicholas (1993), lists the demonstrated outcomes, noting some degree of progress in the following: • **sense of control** • **independence and self-reliance** • **positive attitudes** • **enhanced self-esteem** • **mechnism for self-analysis** • **charting learning progress** • **more accepting of learning as a challenge** • **identifying learning weaknesses** • **managing the quantity of information** • **more global view of insformation** • **lateral information seeking meaningful learning** • **develop reflective thinking** • **improve memory** • **increased concentration and focus on the task** • **develop skills of sellf directed, antonmous learning** • **transfer of learning** • **exchange of ideas** • **improved test scores.** These illustrate where the emphasis in most of the RBL studies listed was missing, particularly in relation to authentication, negotiation of a relevant, authentic learning purpose, establishing and developing prior knowledge and ensuring ownership of learning, and in the failure to use the information gleaned with purpose, or with discrimination. There was a feeling throughout of gathering information with no understanding of the cognitive aprocesses needed to turn information into personal, relevant *experienced* knowledge. Irving & Snape (1979) commented that "Young pupils frequently begin their 'research' from the standpoint of total ignorance of a topic". Sanger (1989, p. 304) sees 'framing'as something done by the teacher, which disempowers the learner, and says" We can also be aware that, in establishing curricula, what's inside the frame may be finite, but its reconstruction by pupils can follow infinite paths. This enablement of pupils to reconstruct, account for, discriminate and critique what they are being inducted into is the genesis of autonomy. This genesis provides a powerful base from which to launch confident information handling." The fact that this base was NOT provided in the majority of these topics provides invaluable insight into why so little has changed over thirty years. At least part of the answer seems to lie in the conscious application of constructivist pedagogic principles to address the idea of student-centred versus teacher/library-centred learning as Todd and McNicholas illustrate.

APPENDIX 2: Table 2: PROPOSITIONS

From the teachers' accounts of student learning which propositions...

	Questions	Primary	Secondary	Tertiary	Trends/ emphases
2.1	were mentioned most/ used best? were mentioned least/ used least well?	Most even spread of use; least emphasis on formal assessment and need for co-evaluation. Increased emphasis on authentication and Props 1-4 in 5C, and good use made of these props but not Props 5-8.	Almost no awareness/ use of Props 1-3 initially. Most assumptions made at Prop 6,7 (knowl. construction). Most progress made coaching Props 4,5,6. Some progress on 9, 10.	Props 1 - 3 used intensively as diagnostic/ explanatory in Cycles A & B. Cycle C & D more awareness of assumptions made in Props 4 - 8 and progress made in planning to coach, directly or through revised materials.	Primary tended to confirm existing practice & spent less time diagnosing problems and more time trying to embed better strategies into all props. Significant progress in using Props 1 - 3 in Cycles C & D made by all pri.. Secondary could see potential for better coaching of Props 4-8. Where tried results were very positive but constraints (time/ timetabling/ curriculum) made committed use of all props challenging. Tertiary put emphasis on diagnostic use and focused on Props 1-3 to define nature of problem and (Cycle C and D) to devise solutions.
2.2	elicited most problems for students?	Initially all props proved problem IF students were using 'project mode', and unless teachers re-focused it using Props 1-3 and KEPT re-focusing. All primary students struggled with not reading selectively and with analysing, collating, synthesising in Props 6-8	Student model of learning and view of role of teacher influenced use of any/all props. Limited time for coaching where it was most needed - Props 5-8. Many students struggled with using info. selectively and analytically to construct knowledge. Coaching did get results.	Instrumental view of learning, lack of time and skills, and 'baggage' of past habits affected use of all props. Many did not recognise that their skills were inadequate. Wanted quick easy route. Where strategies were applied (props 1 - 3) significant improvement in learning.	
2.3	elicited most problems for teachers?	Initially all props were used in context, but superficially, and with element of teacher-control reflecting age of learners. Teachers found it relatively easy to enhance use of Props 1 - 4 and relatively difficult to enhance Props 5 - 8. Single biggest change - depth of teaching reflected in deeper student learning and more student control of learning, particularly Props 1 - 4, 6.	Props 1 - 3 were seen as not modifiable by teachers (but not by researcher). Teachers preferred to focus on strategies (Prop 6-8) for enhanding understanding and presntation. Coaching worked well, but student ownership of learning increased less than pri./ tert. because props were coached within what remained a teacher-centred, not learner-centred model (due to secondary systemic constraints).	Props 1 - 3 were seen as huge problem (Cycle A & B) but as partially soluble (Cycle C & D). Prop 4-8 seen as challenging because they lacked time and skills for teaching in these areas. BUT inn Cycles B & C made signficant progress. Unlike primary where progress = coaching strategies, tert. teachers developed systemic solutions and were more aware of how improving Props 1-3 would flow on to remainder.	At all levels the use of the props was compromised by student models of learning motivation and prior experience. At primary it related to their already entrenched allegiance to the 'project model'; at secondary it manifested as a desire for spoonfeeding; at tertiary it appeared a more complex construct related to age/ life experience/ reason for studying, expectations of teaching and learning. Contextual factors differed between pri/sec/tert and influenced use of props. Pri. and Tert. saw how more emphasis on Props 1-3 resulted in improved student control. Sec. focused on honing more traditional 'study skills' approach.
2.4	were unachievable/ unrealistic?	All props were compromised by fragmented, too-full curriculum and tendency to focus on breadth at the expense of depth. BUT, where teachers did slow down and focus more precisely, they achieved levels of student control of learning and quality of learning, that surprised them, i.e. what initially appeared unrealistic was not.	All props were compromised by fragmented, too-full curriculum, time-tabling and tendency to anticipate exams. Teachers saw Props 1-3 as less significant than Pri. and Tert., and saw the totality of the Framework as unrealistic, but elements within it (like coaching in Props 6-8) as useful for improving learning/ study skills and student control.	Saw student skills & attitudes as compromising the whole approach, but were more positive than sec. about flexibility in the system and their ability to plan learning to put more emphasis on Props 1-3 in particular, and focus on deepening props 4 - 6 (use of info. and analysis). More aware of Props 8 (producing info.) and using technology innovatively.	All saw the props as reasonable and achievable, but only marginally so within current contextual constraints. Only secondary saw deepening learning over the whole framework as unrealistic. Greatest differences emerged between Sec. and the other two. Both Pri. and Tert. saw greater depth as achievable, particularly Props 1-3. Pri saw better coaching as possible; Tert. more likely to see ways of overcoming constraints and (Cycles C & D) how they could help by building in more analysis, etc.
2.5	produced any major shifts in thinking and practice?	Pri. were delighted at how student learning deepened. All paid more attention to Props 1-3 and all shifted to seeing the need to coach much more intensively at Props 5-8. Co-direction and proactive coaching integrated by Cycle D very effectively by two and quite effectively by two.	Fewer shifts noted but several mentions of skills (particularly Props 4-8) which had previously been assumed and were now being better coached. Overall, more effective use of props as diagnostic to monitor learning process and make students more aware of the how of learning, not just the what.	Most significant shift in terms of being able to 'name the devil' - use Framework flexibly and diagnostically to define constraints specifically. Made larger shift than other two sectors in seeing how systemic constraints could be overcome through better design of learning programmes.	All three sectors made different shifts. Primary made large shifts in using Props 1-3 to give students more control over their learning and deepen learning. Secondary made shifts in more precise diagnosis, formative monitoring and coaching to improve traditional learning. Having 'named the devil' tertiary applied props diagnostically to the whole system and could see precise areas/ props that could be targeted.

Comments/ exceptions/ null findings

• One primary treacher had residual concerns about low ability students and the framework. These remained despite comments about student success and more than 20 examples of lower ability students succeeding from other primary teachers.

• There was discussion among primary through the year as to whether the developmental needs of students should be reflected in a sequential whole-school schematic approach. At the same time, all the Props being implemented with 5 year olds made them question the need for anything schematic. This was not resolved.

• Teachers at all levels tended not to differentiate between Props 1,2,3 4 and 5,6,7,8. At all levels they used broad schema covering, firstly, some sort of brainstorming and question-asking and finding some information, and, secondly, doing something with this information. There were shifts, at all levels, as teachers developed a broader conceptual and technical vocabulary to differentiate differnt learning strategies within these areas, but it was only at primary that systematic efforts were made to coach more specifically in 5 - 8.

• At all levels initially the notion of proactive teaching was not understood or used (not resisted; simply unfamiliar); nor was the notion of getting students to 'rehearse' their learning approaches or articulate process. All teachers gradually shifted, with primary accommodating proactive coaching most readily and tertiary seeing how it could be integrated into assignment requirements as checkpoints.

Appendix 2: Table 3: ASSUMPTIONS : context

From the teachers' accounts ...

	Questions	Primary	Secondary	Tertiary	Trends/ emphases
3.1	what were the main contextual constraints to this type of learning?	TIME: crowed curriculum; pressure (ERO?) to cover ALL objectives; need to shape social behaviour, not just learning behaviour; fragmented day; continuous interruptions. VIEW OF LEARNING: Initially saw learning in vague general terms of personal/social development and enquiry and (except TL) were limited by lack of clear, differentiated view of the learning skills required for the process. Less of a constraint for all later. INTERRUPTIONS more of a constraint than at other two levels. Teachers still had flexibility to block out chunks of time, but frequently groups of children were out of the class. Too much 'busy work'; explicit criteria not used - no time to evaluate. AGE of learners made it hard to teach individuals although teachers recognised need to do so. Did lots of group work; felt with more time, fewer interruptions and smaller classes more could be done with top and bottom ability students. Pointed out that everything took more time because classroom management and social systems were still being developed PROJECT MODE and teacher-pleasing constrained transfer. Students saw purpose to please teacher; do what teacher wanted, not necessarily to learn. Most teachers wanted superficial projects and got them! PLANNING in syndicates tended to condone planning topics and was counterproductive to CILL emphasis on planning learning.	TIME: curriculum coverage pressure; time-tabling; no time to teach students how to learn plus content/ factual/ recall learning needed for exams. Analytical/ critical learning un-familiar to students - took time to develop. VIEW OF LEARNING: influenced by pervasive feeling that secondary system would never accommodate this type of learning and the best they could do was improve student learning/ study skills - could see problem but beyond individual to fix. ASSUMPTIONS: Teachers not taught to teach learning; initially found diagnosis hard. Felt that all secondary teachers just hoped/ assumed that students had skills but did not have time/ skill to do much about it. STUDENT ATTITUDE: The students who were turned off learning and school, 'hardened', were differentiated from those who wanted knowledge. Hard to accommodate both. ALL students preferred spoonfeeding and structure. Responded well when they saw topics as relevant and were given clear guidance.. STUDENT READING/ LITERACY LEVEL was not adequate to nature of learning task or level of material required. Many were used to factual learning; found conceptual, abstract learning a problem. RESOURCES at right levels a problem. PLANNING seemed to be determined by systemic structures - coverage, timetabling, ASSESSMENT - no sense of being able to move, or flexibility - tensions between systemic requirements (exams, NZQA, parental) and what they wanted for students.	TIME: courses crowded; signficant% was 'independent' self-directed inquiry'; not enough time to teach required skills. Students' time/ economic/ work pressures meant they wanted the quickest and easiest way to 'get' content. STUDENT VIEW OF LEARNING: influenced by instrumental, vocational attitudes. Wanted the quickest/ easiest way to get the qualification. Paradox that some enjoyed being stretched on CILL but still preferred spoonfeeding and quick fixes. Study just one of many competing interests in students' lives.'Adult' students more inclined to become engaged. PEDAGOGY: Teachers not taught to teach learning; recognised need and wanted skills BUT systemic constraints major obstacle initially. STUDENT READING/ LITERACY/ KNOWLEDGE LEVELS were a problem and there was no time to remediate. Negative 'baggage' sometimes a barrier. Even when skills/ knowledge/ ability not a problem, students tended not to use/ transfer prior skills and knowledge unless instructed to do so. Even very able students expected NOT to have to find out. Many could not read text critically or analytically and would avoid it unless pushed. ASSESSMENT was less a problem than for Sec. but the pressure from a wide variety of subjects and courses meant that most students left everything till deadline and preferred 'one hit', eg essay, to documenting process, eg portfolio, over time.	Time was seen as the biggest constraint at all levels and had over 120 separate NUD*IST entries. Student attitudes/ expectations were the second most frequently mentioned factor at all levels, but for different reasons. Solutions: Primary had most flexibility, secondary least. Primary teachers could choose to teach for depth in some areas and 'surf' others because assessment was not a problem.This required a strong overview of learning and confidence. These teachers had it and made big strides, but felt it would not be possible for all. Even very competent secondary teachers did not feel that they had the time or freedom to choose. They could see (and used) opportunities for improving learning within existing systems, but could not see possibilities for overcoming the major systemic constraints. While tertiary had even more systemic and student constraints, they did have more professional freedom, and while, like secondary, they were powerless to change systemic constraints, they proved that they could influence their courses and their students within existing constraints using better assignment planning, checkpoints, monitoring, peer tutoring, and 'reflective conversations' within tutorials, etc. Many primary methods were seen as useful for tertiary teachers and adopted. At all levels teachers recognised that students' desire for structure, clear guidelines and scaffolding indicated that they wanted to be taught how to learn; that they wanted and welcomed formative feedback and checkpoints. All teachers, especially secondary and tertiary, recognised that they had made assumptions about students' learning and skills that had significant implications for their pedagogies. They also came to recognise that at all levels students liked CHOICE, and that choice was different from unfettered freedom. By the end constructivist design principles were seen as normal good planning/ teaching practice.

Comments/ exceptions/ null findings

One of the challenges of using audioconferencing in extrapolating constraints was that teachers tended to talk in shorthand if they felt that other participants understood, and they tended to use, for example, 'ERO' as shorthand for everything that was bad about assessment, even if what they were saying had nothing directly to do with the agency called ERO! Quantitative measures of how many teachers said something how often were meaningless, but the NUD*IST nodes and ENDNOTE indexing were invaluable for drawing themes together, and establishing where themes persisted over the four cycles, or changed shape. For example the constraints (depicted above) remained constant, but HOW they were addressed, and to what extent, varied greatly by Cycle 5D. In Cycle 5A & B teachers came to the understanding ('naming the devil') that the constraints were systemic, indentical across levels, but influencing each level differently. There was a palpable sense of relief, and some sense of having become a 'community of enquiry'. The data did not suggest this, but the researcher's inference was that it was this sense of becoming a community of enquiry that helped teachers to regard what we were doing as generating data, and contributed to their growing sense of operating as researchers as well as teachers which gave them the courage (in Cycle 5 C and D) to take more risks with trying, through systemic and pedagogical experimentation, to overcome some of these contstraints. It was also the researcher's inference that it needed an overview of all the prompts to give form and focus to teachers' views of the type of learning they wanted their students to achieve, and to see how this might be done.

Appendix 2: Table 4: ASSUMPTIONS : control

From the teachers' accounts ...

	Questions	Primary	Secondary	Tertiary	Trends/ emphases
4.1 4.2 4.3	what did the data say about: • students' existing ability to contol their learning • students' willingness to take on more responsibility for controlling their learning • the extent to which it appeared to be related to - self-regulation - self-efficacy - self-esteem - confidence - motivation	Ability to control learning is not expected by teachers, given age of students, to same degree as sec. and tert. but this leads to teacher-control through use of reactive pedagogies unless student-control is factored into PLANNING. Student-control seen to relate more to topic than at sec. or tert. Discussion on 'reducing knowledge to topics' at pri: "We've 'done' space". Seen as counter-productive to reading/ learning for understanding. Student control influenced by degree to which topic was sensorily and experentially relevant, eg designing the garden, ie *if* they could *see, feel, experience* outcome and *thought* at deeper level about issues. Also need for *personal* slant, eg chose individual roles for planet project. Clearer idea than sec. or tert. that students needed procedural knowledge and overview of framework. to control learning. Students demonstrated that they could internalise framework and props and enjoyed sense of control. Authentication, prior knowledge and ownership blurred but *choice* seen to be big factor in establishing control, ownership and authentication at this level. All saw prior knowledge as essential for student control. Used strategies like brainstorming, picture brainstorming, picture discussion, reading and discussing related story. Self-efficacy recognised as important for control but not named, eg "Hate to feel they haven't got a skill". Evidence of all teachers coaching skills and getting feedback on confidence in using skills.	Ability to control learning is not *wanted* by most students. Noted paradox of students working quietly on structured task and enjoying it but learning nothing. However, all acknowledged that better structure of learning with more checkpoints, skills coaching and feedback paid off in terms of student control of learning and quality of learning. Student *desire* to control learning was related less (than primary) to nature of topic than to overall attitude to school and learning and attributions of self-as-learner. Agreement that some still had deep 'need to know' and liked being given rich factual knowledge, but not having to find it out for themselves - "Another project!" Teachers did not see it as important (as primary) for students to 'own' the process, or self-efficacy as contributing to control. Overwhelming feeling of the secondary system as being 'done' to students with *neither* students nor *teachers* able to exert much control. Feeling that ownership, for both, would always be compromised by the 'tyranny of exams.' Student indifference and teacher spoon-feeding was seen as inevitable; any changes that could be made to improve student control of learning were at the strategy-specific level, eg for notemaking, questioning, planning presentations. Talked about student need for self-direction and self-regulation but saw them as *student* attributes rather than something that could be designed into learning and influenced by teaching	Ability to control learning is not *wanted* by most students, "They don't own it. They don't want to." However, unlike secondary, this didn't seem to reflect boredom or indifference to the topic/ learning/ the institution as much as a sense of their time being precious and wanting to "get the bit of paper" and *pass* as effortlessly as possible. There *were* exceptions, "Some people like learning this way," but many students saw enquiry methods as wasting their time. It reflected, not an inability to control learning, but a very restricted view of what learning was, and an unwillingness to accept that they might not have, and might need to *learn*, the type of skills required for this type of learning. There was a sense that they saw themselves as already full-formed as learners, merely having to do a series of tasks to get the piece of paper. There was no sense that they saw themselves developing *as learners* and very little sense of self-as-learner. Tertiary teachers, however, were more like primary in recognising the need for self-efficacy, self-regulation and their link to effective control of learning. They recognised that they did not have the skills to teach these metacognitive and metalearning skills, and were willing to experiment with learning design and coaching concepts. Talked about the phenomenon of 'social reponses' - when teachers asked students how they were doing and they said "OK" although they were not, ie need for formative, documented evidence of control - checkpoints.	At all levels the purpose students perceived *purpose* for the learning, and the relevance of the topic influenced their *desire* and ability to control the learning. 'Relevance' at primary was more likely to relate to sensorily experiential topics where student involvement was personalised through roles. At secondary control was elusive, but students *did* respond well to direct coaching of strategies within CILL steps and stages, and did appear to feel satisfaction at their greater level of control. Relevance at tertiary was a more complex construct. The actual topic was less significant. Relevance was tempered by the fact that 'authentic' meant different things to adult learners and different things to inexperienced/ younger adult learners than older, more world-experienced learners. Teachers at primary and tertiary embraced links between authenticating learning and student ownership and control of learning, but interpreted it differently - primary putting more effort into building students' prior knowledge and understanding of the structure of the topic (mapping it) and walking them through the whole framework, while tertiary saw authenticating in terms of the actual learning process, and the learner's competencies as a 'missing link' which they could address. They also saw that more formative checkpoints and more precise monitoring could be built in to achieve far greater control for students *and* for them as teachers. Student control of learning had more *emotional* resonance at tertiary than other levels, possibly because primary teachers were already *more* student-centred and just needed to become more *learner*-centred. This was done by (eventually and gradually) integrating proactive strategies into existing practice. For tertiary it was more of an 'ephiphany. They suddenly recognised (Cycle 5 C & D) that they *could*, within existing constraints, influence significantly the degree to which students fel that they were in control of the learning, and had the skills and competencies to succeed, and learn at a deeper and more critical level than previously.

Comments/ exceptions/ null findings

Given the core role 'control' plays in the emerging theory and design of constructivist learning, it was interesting to observe that 'control' was not a term used by the teachers, but used relentlessly throughout the process by the researcher! All primary teachers used 'child-centred'as a descriptor for primary teaching, but it was little more than a slogan because, in their frequent remarks about how challenging this type of teaching was, and how it compared with what their colleagues did, it became obvious to the researcher that much of what 'worked' for teachers was, in fact, teacher-centred and reactive. All primary teachers noted that greater attention to Props 1 - 4 turned child-centred into *learner*-centred, and more positive comments were passed in relation to changes in student learning practices and attitudes in this than any other area. Of the three assumptions, context, control and coaching, there was more difference here between educational levels than any other, and, to the researcher, clear and unexpected evidence of greater similarity between primary and tertiary, both in terms of understading the significance of 'control' for students, and in terms of strategies needed to address it. The difference between them lay in the way they planned learning. All teachers eventually saw the need for mental rehearsal of the learning, but tertiary were more used to designing whole learning sequences and developing assignment outlines and course materials well in advance of teaching.Secondary tended to plan in terms of content objectives, whereas primary were increasginly willing to plan using *learning* criteria derived from outcomes in new curriculum statements..

Appendix 2: Table 5: ASSUMPTIONS : coaching

From the teachers' accounts ...

	Questions	Primary	Secondary	Tertiary	Trends/ emphases
5.1	where was the need for coaching most evident - related to which props?	Primary t eachers *did* coach, and the teachers who had done and were doing the *Infolink* course had a wider repertoire of strategies, and awareness of need. But ALL teachers became aware that their coaching had, previously, largely focused on helping students to brainstorm, get motivated, develop questions and find information, and on the social structures necessary for groups to self-manage and take some responsibility for own learning.	Teachers were very aware of students' skill and knowledge deficiencies, and saw most opportunity to enhance what they already did by coaching more focused skills for shaping questions, reading for understanding, notemaking and structuring information clearly and concisely. Found it hard to think beyond systemic constraints (tension between coverage and exams and need to coach skills)to work out optimum strategies for coaching across all props.	Teachers were well aware of students' learning skill deficiencies, and admitted that their own training had not equipped them to teach these skills (but nor did they have the time). More so than primary or secondary they saw opportunities for changing how they designed learning and study materials to incorporate 'indirect' coaching. One teacher could see enormous potential for using information technology creatively to embed this coaching as 'self-drive' steps in disk- or emai-based materials.	At all levels teachers perceived that they had made assumptions about students skill level. Initially (Cycles 5 A & B) the deeper insight the Framework provided into the extent of this type of learning helped them to diagnose student learning behaviours more precisely and it depressed them. At all levels (Cycle 5 C & D) they set about finding solutions that were expedient for them at their level. The quantity and *quality* of the coaching (selecting and implementing the most appropriate strategies with confidence) was one of the significant achievements of the study.
	Prop 1: AUTHENTICATING LEARNING	By coaching self-as-learner strategies and by ensuring that students had adequate prior knowledge (and could map it and discuss it), and by making each other more aware of how the quality of students' questions influenced later stages, teachers coached enthusiastically to achieve greater student ownership of and engagement in their learning and recorded signficant success.	For similar reasons to those given for student unwillingness to take control of their learning, teachers were negative about authenticating learning, seeing it as their inability to change mandated curriculum topics, inability to make many students find ANY learning, or topic, relevant and motivating. They tended to be as negative about this prop as primary were positive!	Teachers were aware that student engagement, motivation, willingness to self-regulate and take responsibility for learning needed to be enhanced. They, more than the other two levels, welcomed the breakdown into specifics, and used 'authenticating' the learning as the driving concept for much of the diagnostic thinking they did during Cycles 5 A & B and the solutions they tried during 5 C & D.	Authentication was seen by primary as something essential for the teacher to do at the beginning in terms of making the topic relevant to learners. At secondary it was seen more as a pervasive state of learners mind, subject to little teacher influence. At tertiary it was seen to mean relevance to students as learners and students' purpose for learning rather than relevance of topic. Only one teacher placed emphasis on self-efficacy ("kids need to know skills") as part of authentication.
	Prop 2: PRIOR KNOWLEDGE	All teachers recognised the need and did more - it was more an difference in degree of emphasis because all had done it previously. At the end they were all more confident in coaching skills.	Both teachers recognised that students often lacked an adequate base of prior knowledge but had difficulty seeing how to overcome time contraints to incorporate it.	Prior knowledge could be negative 'baggage', eg failing bookkeeping influenced attitude to accounting. Knowledge that particular topics/ approaches were valued in the workplace was motivational.	All shared an understanding that prior knowledge was important, but as the study progressed, differences emerged between what constituted prior knowledge, why it was important, and how to enhance it at different levels..
	Prop 3: OWNERSHIP	Came to be seen as inevitable consequence of putting more emphasis onto Props 1,2,4. All liked the term 'ownership and used it comfortably. Three saw internalising framework and props as essential to ownership. One said "not so much 7 years olds" but agreed for 9 and 10 year olds.	Spent a lot of time discussing paradox that students did not appear to *want* ownership, but that they did want knowledge. From some of the really positive learning that resulted this prop. possibly had more mileage than they gave it credit, "All of them without exception found it an enjoyable activity, I think."	Both saw ownership as influenced by instrumental attitudes to learning, but, by the same token, as achievable through putting more emphasis on the purpose and making the process and the criteria more explicit and establishing checkpoints.	While systemic constraints militated against it at tertiary more than other levels, tertiary saw it as valuable in terms of extending their own pedagogic range, and deliberately structured checkpoints to get and give more feedback and 'buy' student ownership. Primary saw it as crucial, secondary were more inclined to see it as desirable but unrealistic. All described it as 'motivation.'
	Prop 4: KNOWLEDGE NEEDS	Teachers saw purpose as crucial, "If they are really involved in the topic, you can't stop them trying to find out more." Neverthless, few strategies for improving quality of student questions except 'Ws'. Two used researcher's suggestion of focusing questions on knowledge map, ie to give focus on broader area of knowledge need, not just questions. Worked well, but they did not see link,	Some evidence that secondary teachers found it necessary to frame questions *for* students to ensure that curriculum objectives were covered. Frequent references to students' poor skills in using questions to retrieving relevant information; some comments about students copying anything vaguely relevant to topic and not using questions as focus.	"Just assumed that they could do all that". "Well, yes, I think they just expect it to be there. Yes. They expect someone to put a book in front of them and to say, "There it all is in simple language that a 13 year old can understand... all you need to do is maybe have a look at it." Both teachers assumed skills, and relied on the library and librarians to teach skills if they were lacking.	Both primary and tertiary saw students' questions as the only way of defining knowledge needs, and both saw the quality of their questions as influencing how students retrieved information. Tertiary saw the whole assignment as the students' knowledge need and did not have any strategies for getting students to articulate their knowedge needs - in questions or any other forms. One referred to building the requirement to use Index NZ into the assignment. At all levels not much thought given to *pedagogical* implications of this Prop, eg search terms.

Continued overleaf

Appendix 2: Table 5: ASSUMPTIONS : coaching contd.

From the teachers' accounts ...

Questions	Primary	Secondary	Tertiary	Trends/ emphases
5.1 contd Prop. 5: SELECTING INFORMATION	Two primary teachers were particularly pleased (when they focused more consciously on Props 1-4) with the amount of information students found independently, and the quality of that information (in terms of being more focused to questions and information purpose). They also noted students' enthuasiasm for a stage of the process they often found frustrating. Useful strategies evolved, like noting sources in learning journals, listing information sources, notemaking sheets focused on questions	One teacher had library responsibility and talked at length about how much help students needed and how little they got (in terms of library staffing and other teachers' limited knowledge of the library and what was involved). Agreement that Internet was not being used well, or guided by teachers, and agreement on need to bookmark sites and supervise/ guide use. Other than that the secondary teachers participated only marginally in these discussions.	Even at this level, there was the expectation that information should be pre-packaged, and that, if effort was needed to find it, there was something 'wrong' and it was a waste of their valuable time. Again behaviour seemed to reflect their overall view of what learning was and was not. Some evidence that what students were looking for was facts, not ideas. There was no evidence that these tertiary learners saw looking for 'best fit' ideas as part of learning, or what they were there for.	At all levels student behaviours reflected their models of learning, but primary made far more progress than the other two sectors in tying student searching behaviours into their learning purpose and driving questions, with consequent increases in motivation and self-efficacy. At all levels this was the area which received least emphasis by teachers, and where teachers made least effective use of the breakdown into skills and strategies within the props. Primary saw problems with overload. All saw the need to bookmark sites, and all saw need to go from retrieving information to some *cognitive* process involving evaluating and analysing the information and 'wrestling with the ideas' to a greater extent than had been done in the past. Noone related to 'working with information.' Later suggested 'analysis.' Adopted. While negative attributions about shallow learning abounded at all levels, but particularly sec. and tert. It was only in Cycle % C & D that there was widespread recognition that - teachers did not teach it - it could be taught - it *should* be taught. Primary and secondary. saw it as more achievable within current constraints than tertiary because tert. course structures did not allow time, many tertiary students did *not* see the need to learn learning skills, and both tertiary teachers felt they needed to know more about teaching strategies. They saw the need and had read books and experimented, but saw it as an intransigent problem beyond their resources to 'fix'..
Prop 6: WORKING WITH INFORMATION	Real concern expressed by all teachers at tendency for primary to find masses of information and not want to write it (all) down. Strategies used included answering questions, writing it in own words. One teacher limited pages that could be copied/ downloaded; students then highlighted key ideas and wrote in own words. Another got students to write straight into wordprocessor file.	Some evidence that this happens within subject domains, generally through teacher-led dialogue, but there was no evidence of ability to select 'best fit' information and use information sources analytically and critically. Where this was done in the context of CILl, improvement was noted, but it was clear that the extra time given had played havoc with curriculum planning.	Both teachers said that this was an area they had assumed. Neither had taught, or felt they had adequate strategies for teaching students how to 'wrestle with ideas'. one, in particular, saw 'reflective conversations' as offering the opportunity to build challenging questions into assignment requirements and materials and both were pleased with results when they tried Prop 6 strategies.	
Prop 7: CONSTRUCTING KNOWLEDGE	All teachers recognised the need and did more - it was more an difference in degree of emphasis because all had done it previously. At the end they were all aware of the need to do more.	Both had assumed many of these skills. Came to see need to coach more systematically and overtly. Had not previously seen link between recording and organizing info. and constructing *knowledge*.	Saw the need to 'construct knowledge from information' more than other sectors, and saw that audience and purpose influenced what was constructed more than the others - but not how to help.	
Prop 8: COMMUNICATING KNOWLEDGE	Without putting any more emphasis on the product 3 of the 4 teachers noted that the greater emphasis on the early stages paid off in terms of significantly better work produced.	Very little awareness of audience other than teachers, and 'products' tended to be very traditional written format, although teacher noted better focused work.	One tertiary teacher had the confidence and competence to harness some of the new concepts to technology - and looked at how new media could be used to reflect thinking.	Primary and tertiary used more imaginative ways of communicating knowledge, and one primary and one primary and one tertiary used technology to achieve more effective communication. Primary used authentic audiences more often.
Prop 9: PROACTIVE COACHING	The idea of 'rehearsing' the stage in advance of the learning, asking learners to say what they were going to do and how they would do it, using which skills, etc, was foreign, and took until Cycle 5 C & D to consolidate and be integrated into practice.	As with primary, the idea of proactive rehearsal and coaching was foreign, but there was gradually more acceptance of planning *process* in the head, and coaching skills *before* students went off instead of assuming that they had skills and giving feedback *after* the event.	Like primary and secondary, intially a foreign idea, but 'front end loading' the planning was seen as useful and led directly to changes being made to assignment planning and materials. Evidence, towards end, of far more ability to think it through *as a learner* and visualize the learning.	At all levels teachers initially had difficulty coming to terms with the idea, but this was as much the fault of the researcher's search for terms and frames of reference that would make more sense *to* them. The primary took it on board at the end in terms of demonstrated practice, while the tertiary could see how assignment planning would change to reflect their greater awareness.
Prop 10: CO-EVALUATION	Formative co-evaluation a comfortable concept, but establishing concrete criteria for what good process and product could look like was not. Usually done by walkabout with criteria that were implicit. Seldom shared criteria with students. 3 of 4 moved to see student ownership of criteria as important.	Unlike primary who were keen on student self-evaluation secondary initially saw assessment as more the role of the teacher, evaluated against achievement of curriculum objectives (content) rather than using criteria related to quality of learning. Both tried new approaches and found them effective.	Both seemed to gain from hearing about primary strategies. Tangible 'transfer' in adoption of checkpoints to provide formative feedback and get shared understanding of procedures for next stage. One teacher could also see potential for formative self-check assessment points built into software and assignment guides.	All teachers were quick to see the need. Primary made the biggest shift from 'did you enjoy that/ how did you feel about yourself...?' approaches to seeing how criteria negotiated in the early stages gave the formative and summative assessment coherence. Secondary moved from assessment of content to seeing co-evaluation of process as well as product as possible, and tertiary saw more need to emphasise criteria related to *learning*.

Table 6: USES OF FRAMEWORK : chief uses

From the teachers' accounts what were the chief uses to which the framework was put?

	Primary	Secondary	Tertiary	Trends/ emphases
Overview	All referred to this often.	Occasional references.	Several comments.	All saw overview as really valuable.
Diagnostic	Particularly in relation to Props 1 - 3 (Cycle 5 A & B), setting up learning.	Some evidence in relation to props 1 - 4 in Cycles 5 A & B.	Particularly in relation to Props 1, 3, authentication and ownership.	Primary teachers evidenced most consistent and coherent use of the Framework for diagnosing student need, integrating emphases from the Props into what they were planning to teach, and how they were expecting students to learn.
Planning	In Cycle 5 A & B in relation to Props 1 -3 in particular; in Cycle 5 C & D in relation to using props proactively to plan more explicit coaching.	Data showed little overt influence of the use of the framework on planning practices.	Planning for more authentication and ownership of learning (Props 1, 3), and more checkpoints with more explicit criteria and built-in coaching (Props 9, 10)	Secondary took an expedient approach, using all the Props to confirm and deepen their understanding of their students' learning approaches, but coaching only in a very limited range.
Coaching	What was planned, in terms of coaching in relation to Props 1,2,3,4, and, to a lesser extent 5 - 8, was carried through with significant improvement in student learning noted	Props 6 and 7 were used in Cycle 5 B to inform coaching in relation to Props 6 - 7, making better use of information, and using the cocnept of 'constructing knowledge'.	The constraints of time, teachers' perceived lack of skill in coaching learning-to-learn, and the nature of students' own perception of needs militated against much direct coaching.	Tertiary saw little room for direct coaching, but much more than the other two sectors, for in-depth planning and integrating coaching into study materials

Table 7: FRAMEWORK : suggested amendments

From the teachers' accounts what were the chief uses to which the framework was put?

Aspects	Primary	Secondary	Tertiary	Trends/ emphases
Wanted simpler version of the Framework	For colleagues For students	No specific comments	For students	Two primary and one tertiary used G's (Gawith, 1984) existing 6-stage framework, one primary created a new one.
Wanted more strategies	General agreement	General agreement	General agreement	Tension, at all levels, between teachers wanting more strategies but simpler framework (acknowledged by them).
Wanted layout showing iteration (done in version 2)	Particularly primary			All said they preferred the circular, less linear Version 2, but primary
Prompts	No overt mention of use but indirect evidence from all teachers that they had been read, thought about and used to broaden personal understanding			were the only sector to refer to iterating consciously through Props.
Definitions	All agreed that they needed to have the definition of terms in front of them. This was done in Version 2 and all said they found it helpful.			When asked they said they thought the prompts were useful, although none had mentioned using them or finding them useful. In particular, they liked the columns of the new
Order of pages	All made suggestions - some contradictory for changing Version 1. Most were incorporated. All liked Version 2 and one primary teacher in Cycle 5D made useful suggestions for a different page arrangement which were adopted.			layout, and said they wanted the CONTEXT map retained, but not the CONTROL and COACH maps.

Table 8: Were there any major 'breakthroughs'?

From the teachers' accounts what were the chief insights/ breakthroughs/ 'epiphanies'?

Breakthrough/ insight	Primary	Secondary	Tertiary	Trends/ emphases
Shift from child/subject/course-centred to learner-centred learning	Big shift in understanding of the importance of Props 1-4 in setting students up for successful learning in all props.	Shift in perception of how much coaching could make students more self-responsible and influence performance in props 6-8	Went from only seeing constraints to seeing significant opportunities for designing better guided and monitored learning.	All teachers shifted, some more than others, some sectors more than others, but the extent of the shift was only really apparent in Cycle 5 C. Repeated iterations in Cycle 5 A & B back to same constraints frustrated researcher but helped teachers to frame WHY NOT and move to HOW.
Confirmation, affirmation and expansion of notions of good practice; greater understanding of how/why information literacy did/ did not/ might/ might not grow across sectors; greater appreciation of problems (but also opportunities) presented by own and other sectors; signficantly expanded view of education in New Zealand	Most obvious at primary; teachers saw their constraints in relation to those of other sectors and explored more opportunties for extending their repertoire of strategies; big increases in confidence noted, especially two of four.	Sense of relief that they were now able to differentiate and see why students struggled. Most progress, therefore, in understanding, and some in specific areas related to the 'how' of student learning. Both enrolled in Infolink the next year so clearly wanted to learn more skills.	Big shift from talking about students as generic recipients of courses, to differentiating and seeing how some constraints could be overcome through emphasis on learners and learning processes, in assignments,materials and teaching practices	While primary teachers used the Framework for positive affirmation, secondary often confirmed negative attributions. Tertiary probably shifted most from seeing an insoluble problem become partially soluble. Both were intrigued by the strategies discussed by primary teachers, and both took 'primary' strategies and implemented them with success at tertiary. All became more positive, but for different reasons,

Table 9: USE OF INFORMATION TECHNOLOGY

From the teachers' accounts how was IT integrated with framework use?

Props	Primary	Secondary	Tertiary	Trends/ emphases
Props 1 - 3	Not mentioned at all	Not mentioned at all	Not mentioned at all	None saw the potential of technology (eg Inspirations) for helping students to frame topics, compile plans using flow diagrams, etc. All expected students to be able to use OPACs to retrieve information, to use CDs (Encarta) and the Net, but primary and secondary all saw the need for teacher help and recognised that without help students tended to play or surf aimlessly.

Attitudes reflected teacher experience and confidence - several exploring confidently (keeping focus on learning) at primary and one at tertiary. The tertiary teacher (taught computing) had a broader vision of integrating IT into all Props with more emphasis on revamping materials and pedagogies. ALL teachers learning not IT-focused. |
| Props 4 - 5 (finding & selecting info) | 2 teachers in particular sparked a lot of discussion about how inappropriate the level of Encarta was for primary, and how indicriminate the use tended to be unless focused. | The teacher with library responsiblity talked about students' ineffective search behaviours, mentioning that other teachers' did not seem aware of their problems and the need to focus searching. | Saw helping students locate information as the task of librarians; had not given a lot of thought to setting students up for successful searching, but expected use of technologies as a matter of course.

Discussion (1 teacher) about role of email in summarising understandings, in using Powerpoint , using InNZ and in having course re-formatted into self-study disks in more 'age-appropriate' format. This teacher was using a range of IT and planning to use more; clear vision. | |
| Props 6 - 7 (finding & selecting info)

Prop 8 (communi-cating knowledge) | 3 teachers had strategies for helping students to make notes selectively from Encarta and the Internet.

2 mentioned finding multi-media very time consum-ing. Databases, word-processing, Kidpix used by 2. 1 did little. 1 did 'some'. All had positive attitude. | Negative comments about how ill equipped students were to apply skills, eg notemaking, in IT environ-ment

No mentions in relation to communicating knowledge. IT didn't seem to be a major school (or personal) interest or focus for either. | | |

Table 10: DIVERGING OPINIONS: Researcher/ teachers

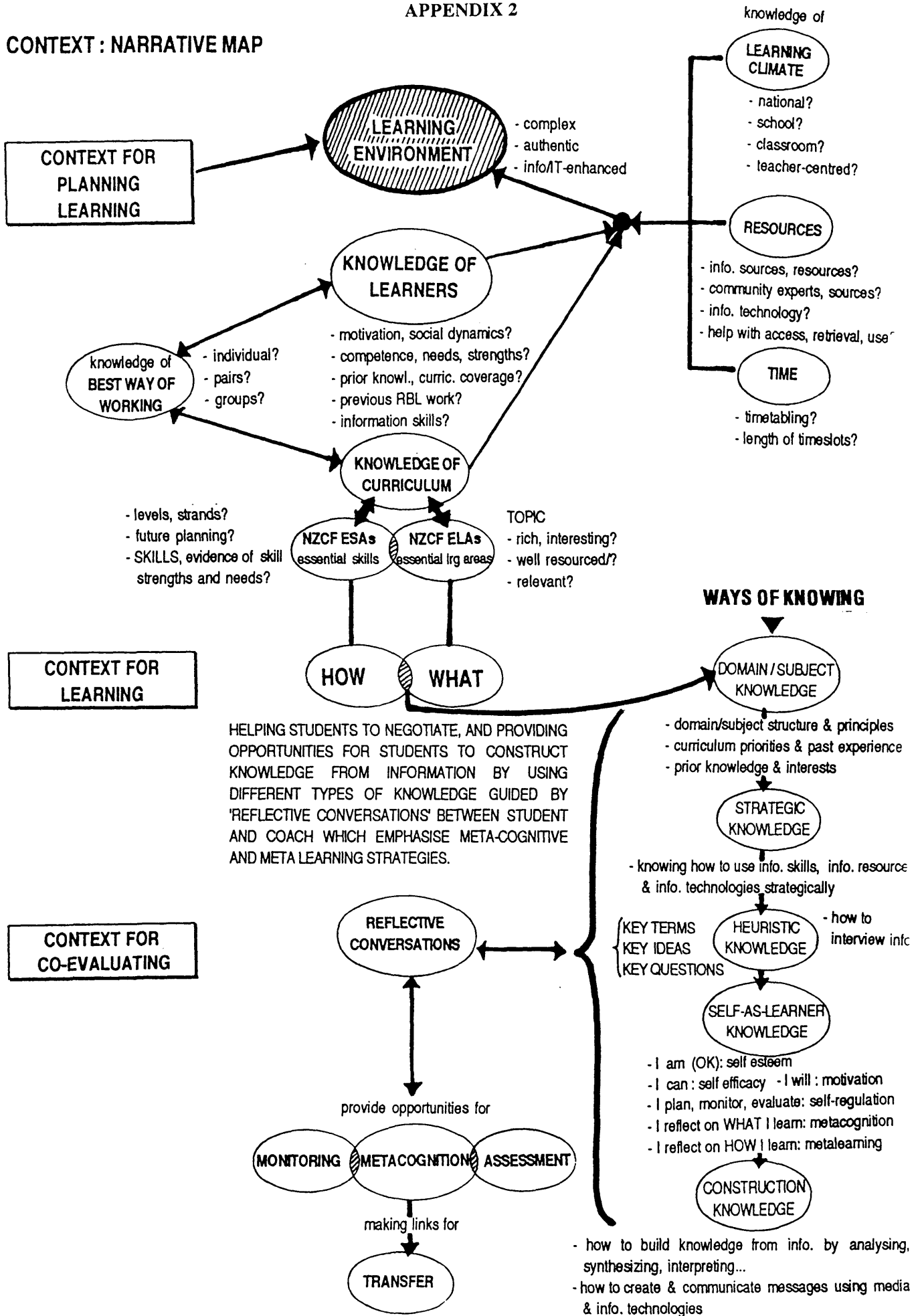Comparing teachers' and researchers' comments and journal were there any divergence of opinion?

Cycle	Primary Secondary Tertiary	Researcher
Cycle 5 A

Cycle 5 B

Cycle 5 C

Cycle 5 D | At the beginning there was a similarity in how teachers saw CILL. Despite the researcher's explanation (written and verbal) that the intention was to explore CILL concepts and Framework, all, initially, wanted, on the one hand, to be told how exactly to 'do' CILL, but,on the other,to explore why, in their experience it 'didn't work...'

At this stage teachers spent a lot of time exploring differences between their sectors, and, specifically, how certain things could be achieved at primary, for eg, and why they couldn't be achieved at other levels. This was the point at which the need for specific strategies was expressed most often and most strongly.

After the mid-year break teachers welcomed the focus on tackling the props and swapping strategies. Teachers tended not to mention things if they felt that the others already knew them and did them, but it was evident that their view had become far more learner-centred than earlier, and, with the possible exception of the second-ary teachers, there was an excitement and new energy which lasted till the end of the project. Success stories and strategy swapping dominated sessions; far less dependence on researcher's explanation; good challenges; good feeling of being learning community | The researcher, initially, felt frustrated that all her attempts to nudge teachers to start exploring the pedagpgy of the Props seemed to end in yet more discussions of the contstraints. It was only at the end of Cycle A, and after she had analysed and summarised the emerging trends that it became obvious that with each loop back to constraints, teachers framed the problems more precisely, expanding their own understanding of the contextual factors; they had needed to do the equivalent of a SWOT analysis.

The researcher could see how a more learner-centred perspective would allow teachers to explore some of the more elusive concepts, eg proactive coaching, heuristic frameworks, but felt she underestimated the time needed to think it through as teachers before they could expand their frame of reference - and also how much she had taken for granted about their understanding of (and interest in) other sectors. She remained frustrated about the lack of takeup of vocab. that would have expanded their conceptual understanding, but by Cycle 5D could see some of the concepts in action, and, in the individual interviews, could see the level of understanding of the whole Framework, and that the Props which had not featured a lot (7,8,9) had, in fact, been 'internalised'. |

Table 11: CONSTRUCTIVIST CONCERNS

Did the teachers' accounts mirror concerns/ issues in constructivist learning design?

Concern	Primary	Secondary	Tertiary	Trends/ emphases
TIME

TRANSFER

ENTRY LEVEL OF STUDENTS

OVER-FULL CURRICULA

ASSESSMENT

TEACHERS' SKILLS | Fractured days, but teachers still have flexibility.

Evidence of transfer of skills, but evidence that same skills not applied with different teachers.

Reading skills prevented skilled use of info without signficant help. Hated all the writing they were excpected to do.

Teachers needed confidence to ignore tendency to 'do' every objective and to go for 'deep' learning.

Not seen as a problem, but they welcomed the greater emphasis on developing criteria

Expected to teach skills and taught some skills well. CILL broadened under-standing of skills needed. | Timetabling major problem - little sustained time available.

Little evidence of previous skills/ knowledge transfer.

Reading skills a real problem.Many other learning skills had been assumed

Expanded curriculum putting a lot of pressure on teachers and students. Timetabling emphasised feeling of fragmentation

Exams dictated approach. Little emphasis on formative assessment or co-evaluation of process.

Both needed/wanted more skills in teaching how to learn. Felt all sec. teachers lacked these skills. Had done courses & read. | Extreme time constraints but came up with innovative ways of overcoming.

Even with high ability students little transfer unless signalled/ required by teacher/assignment.

Reading skills NOT seen adequate to level of work required for critical and analytical literacy. Students avoided it if it took time and effort.

Courses full, but more room to re-shape content.Problem is where and how to build in coaching in how to learn

Welcomed the greater emphasis on developing formative process criteria.

Keen to enhance skills. Both had read extensively and used CILL well. | If anything, this assumed even more importance than in constructivist literature at all levels. Teachers agreed it resulted in teaching for breadth, not depth.

Evidence at all levels of transfer deter-mined by students doing what was needed to meet teacher expectations. Transfer did happen when teachers made links.

All saw students' skills and models of learning as inadequate and (except primary) found it hard to build in skills teaching.

Full curricula; increased paperwork; fragmentation reported at pri. and sec. particularly. NZQA not seen as significant problem at tert. but ERO seen as a problem at pri, "if you let them become one."

Assessment not seen as major problem but pri. needed to focus it , secondary and tertiary needed to include assessment of skills and process.

All teachers needed to broaden skills teaching repertoire, but all had success and fun doing so during the CILL process. |

CONTEXT : NARRATIVE MAP

knowledge of

CONTEXT FOR PLANNING LEARNING

LEARNING ENVIRONMENT
- complex
- authentic
- info/IT-enhanced

LEARNING CLIMATE
- national?
- school?
- classroom?
- teacher-centred?

RESOURCES
- info. sources, resources?
- community experts, sources?
- info. technology?
- help with access, retrieval, use

KNOWLEDGE OF LEARNERS
- motivation, social dynamics?
- competence, needs, strengths?
- prior knowl., curric. coverage?
- previous RBL work?
- information skills?

knowledge of BEST WAY OF WORKING
- individual?
- pairs?
- groups?

TIME
- timetabling?
- length of timeslots?

KNOWLEDGE OF CURRICULUM
- levels, strands?
- future planning?
- SKILLS, evidence of skill strengths and needs?

NZCF ESAs essential skills

NZCF ELAs essential lrg areas

TOPIC
- rich, interesting?
- well resourced/?
- relevant?

WAYS OF KNOWING

CONTEXT FOR LEARNING

HOW **WHAT**

HELPING STUDENTS TO NEGOTIATE, AND PROVIDING OPPORTUNITIES FOR STUDENTS TO CONSTRUCT KNOWLEDGE FROM INFORMATION BY USING DIFFERENT TYPES OF KNOWLEDGE GUIDED BY 'REFLECTIVE CONVERSATIONS' BETWEEN STUDENT AND COACH WHICH EMPHASISE META-COGNITIVE AND META LEARNING STRATEGIES.

DOMAIN / SUBJECT KNOWLEDGE
- domain/subject structure & principles
- curriculum priorities & past experience
- prior knowledge & interests

STRATEGIC KNOWLEDGE
- knowing how to use info. skills, info. resource & info. technologies strategically

CONTEXT FOR CO-EVALUATING

REFLECTIVE CONVERSATIONS

KEY TERMS
KEY IDEAS
KEY QUESTIONS

HEURISTIC KNOWLEDGE
- how to interview info

SELF-AS-LEARNER KNOWLEDGE
- I am (OK): self esteem
- I can : self efficacy - I will : motivation
- I plan, monitor, evaluate: self-regulation
- I reflect on WHAT I learn: metacognition
- I reflect on HOW I learn: metalearning

provide opportunities for

MONITORING **METACOGNITION** **ASSESSMENT**

CONSTRUCTION KNOWLEDGE
- how to build knowledge from info. by analysing, synthesizing, interpreting...
- how to create & communicate messages using media & info. technologies

making links for

TRANSFER

APPENDIX 3

NZ INFORMATION LITERACY LEARNING FRAMEWORK:
10 PROPOSITIONS

CONTEXT

1. INFORMATION LITERACY LEARNING IS CONTEXTUALIZED BY

1.1 helping students to establish their prior knowledge (cognitive and affective) of the topic selected for information literacy learning by using techniques like brainstorming, cognitive mapping, and other techniques for showing graphically the structure of current topic knowledge including discussion.

1.2 acknowledging national and school policies and priorities, school climate and curriculum planning, students' previous experience of information literacy learning, time available, timetabling, curriculum coverage pressures, other demands etc.

1.3 acknowledging students' self-as-learner knowledge which embraces self-esteem, self-efficacy (I can), motivation (I will), planning, self-monitoring, self-regulation, metacognition and metalearning.

---

2. INFORMATION LITERACY LEARNING IS AUTHENTICATED BY:

DESIGNING A LEARNING ENVIRONMENT:

2.1 the choice by the teacher of suitable topic(s) - complex, relevant to curriculum), amenable to information literacy learning (information-rich, information accessible), conceptually accessible to age and level of student, compelling (conceptually challenging and potentially relevant to interests and imagination of students)

2.2 making explicit links to students' understanding of learning purpose

2.3 making explicit links to students' previous curriculum knowledge

2.4 making explicit links to curriculum

2.5 encouraging students to see topic as interesting/ relevant through discussion, input, etc.

- Feedback loop 1.1 - 2.2 - 2.3 - 2.4 helps ensure that students can

  - articulate prior knowledge in relation to curriculum and subject domain requirements/integrity. [anchor/transfer]

  - elaborate on topic as 'problem' in terms of area in which more knowledge is needed; areas of interest for investigation exist; potential richness and complexity of topic are perceived

---

CONTROL

3. OWNERSHIP OF THE LEARNING IS ESTABLISHED BY:

3.1 Encouraging self-regulated learning through providing scaffolds and coaching for:

3.1.1   negotiating strategic planning of learning (covering goals, purpose, audience, timeframe, stages, work patterns (individual, pairs, groups, combinations), roles within group/stages, feedback checkpoints

3.1.2   negotiating criteria for learning process and outcomes (in terms of curriculum requirements [ELAs/ESAs] and subject domain integrity)

3.1.3   negotiating appropriate learning approaches, recognizing

- existing learning styles, strengths, weaknesses
- previous individual and group learning experiences /competencies
- previous individual and group learning needs
- need for strategic alliances (with peers, teacher as coach, experts)

- FEEDBACK LOOP helps to

- link 3.1.2 to 1.1 and 2.2, 2.3, 2.4
- link 3.1.1 to everyday life eg planning trip
- link 3.1.3 to past affective experiences of learning; areas in which students experienced efficacy

ensure that students can
- see themselves as learners embarking on journey
- draw the route map for the journey, see the journey's purpose
- see the resources for the journey as own (individual and shared) learning competencies and external sources and resources

---

4. KNOWLEDGE NEEDS ARE DEFINED BY:

4.1   Establishing heuristic framework

key questions   )
key words/vocab.   ) • FEEDBACK LOOP -1.1, 2.2, 2.3, 2.4, 3.1.2
key concepts/ideas)

4.2   Applying heuristic framework to map of existing knowledge (1.1) to define information needs and confirm and expand criteria (3.1.2)

- FEEDBACK LOOP: share/compare frameworks and criteria.

4.3   Access to information is planned with expert advice in relation to

4.3.1   most appropriate sources of information (print, electronic, community eg libraries, books, journals, Internet, online/CD, bibliographic, fulltext databases, etc)

4.3.2   most appropriate information resources (print, visual, topical, personal experience, etc)

4.3.3   skills needed for accessing/retrieving information within source/resource

4.3.4   skills needed for using information sources and resources strategically and economically

4.3.5   strategies for charting search, noting sources for easy re-location and retrieval

5. INFORMATION SELECTION IS GUIDED / MONITORED

5.1 Heuristic framework is used to
- scan
- skim
- select
- read/view/listen deeply and critically to select/reject/compare/collate information from different sources, resources, media

5.2 Heuristic framework is used to focus
- selective recording of relevant information by notemaking (manual or word processed), database, hierarchical map, graphics, with camera, video, etc).

• FEEDBACK LOOP 5.2 - 5.1 - 4.3 - 2.2/3/4 - 1.1

ensures that:
- information is selected that is relevant to

. heuristic framework (key questions, terminology, concept)
. curriculum requirements and subject domain

- information is collated and related, synthesized.

---

6. SKILLS ARE EMPLOYED STRATEGICALLY FOR WORKING WITH INFORMATION

Coaching / modelling / direct teaching / peer tutoring / questioning / prompting / articulation / elaboration, etc, techniques are used to ensure that the heuristic framework (key questions, terminology, concepts) underpins:

- reading
- listening
- viewing
- interviewing
- thinking
- reflective discussions (with peers, experts, coach, learning community)

---

7. METALEARNING STRATEGIES ARE USED TO CONSTRUCT KNOWLEDGE FROM INFORMATION

7.1 Heuristic framework provides focus for reflective conversations (with peer partners, experts, coach, learning community) using metacognition to establish and articulate

- key understandings
- key facts, ideas
- key opinions, premises, hypotheses
- key causes, effects, problems, solutions

7.2 Metalearning strategies are used to focus reflective conversations on self as learner

- ability to self-regulate learning

- self-efficacy, expectations, approach to learning

• FEEDBACK LOOP 7.1 - 4.2 - 4.1 - 1.1 [learning outcomes]
7.2 - 6 - 5.1,2 - 4.1 - 4.3 - 3.1.1 - 3.1.3

loop back to   [learning process]
previous stages
to expand and
elaborate on knowledge

• FEEDBACK LOOP ensures that

- knowledge gained can be articulared and reflects needs established in relation to prior knowledge and current curriculum need and meets negotiated criteria for coverage and depth [TRANSFER]

- learning process resulted in understanding and meaningful, deep learning, not fact collection [TRANSFER]

- students see need to loop back to retrieve more information (4 Æ 7 repeat) not as admission of failure but as normal successful part of IL which is a recursive and iterative process. As knowledge deepens, the need for more information increases.

---

8. KNOWLEDGE CAN BE PRODUCED AND COMMUNICATED

8.1   'Messages' can be extrapolated from knowledge in relation to

- audience for learning (3.1.1)
- purpose of learning (4.1.1, 3.1.2, 4.1, 4.2)
- medium (technology?)

8.2   Criteria are established for successful communication of knowledge in relation to

- audience
- purpose
- medium
- curriculum requirements and subject domain

---

9. CONSTRUCTION OF KNOWLEDGE AND COMUNICATION OF KNOWLEDGE CAN BE SELF- AND COLLABORATIVELY ASSESSED*

* assess is interpreted as 'establish the extent to which'

9.1   Criteria established cor curriculum/domain knowledge (4.2) are applied to knowledge outcomes

9.2   Relevant/extent/depth of knowledge is related to stages 4 and 5, finding and selecting information

9.3   Relevance/extent/depth of knowledge is related to stage 6, working with information, and to stage 7, using meta-strategies to construct knowledge from information. Links to 1.1, 2.2 - 2.5 made explicitly by coach. [TRANSFER]

9.4   Criteria established for effective communication of knowledge (8.2) are assessed in relation to audience, purpose, medium (technology use?), curriculum requirements (4.2)

9.5   Satisfaction with knowledge outcomes and enjoyment of learning assessed in relation to prior knowledge and analysis of knowledge needs (1.1, 2.2 - 2.5 and 4.1, 4.2)

---

10. CONTROL OF LEARNING CAN BE EVALUATED*

Evaluate is interpreted as 'establish the value of'

The students' ability to control the learning (cognitive, heuristic, strategic and communicative knowledge) can be evaluated through reflective conversations with coach using scaffolding built around:

10.1   Self regulation of learning
-      ability to plan learning and use plan flexibly (3.1.1)
-      ability to manage time and other resources and constraints
-      ability to use learning strengths and overcome weaknesses by
  -      getting help (coach, peers)
  -      working collaboratively
-      ability to monitor stages of learning, seek help where needed and incorporate suggestions

10.2   Self-efficacy as learner
-      ability to use skills strategically (targeted to purpose of learning and guided by heuristic framework) to work economically and effectively, for example in
  -      reading, viewing, listening by scanning, skimming and selecting
  -      recording information accurately, appropriately, selectively
  -      communicating selectively, appropriately, accurately
  -      using technology to expedite, facilitate, enhance process
  -      using strategies (eg mapping, brainstorming) where appropriate

10.3   Attitudes to learning
-      motivation, persistence, determination, patience
-      ability to share, work collaboratively, seek help, use help
-      setting meaningful targets, reaching them

10.4   Articulation of goals as learner
-      ability to identify areas of strength and
-      areas in need of improvement
-      possible strategies for improving these areas to incorporate into subsequent [information literacy] learning

APPENDIX 4 a

CILL FRAMEWORK: VERSION 1

CONSTRUCTIVIST INFORMATION LITERACY LEARNING FRAMEWORK (CILL) :

a constructivist framework for information literacy learning in New Zealand

overview

2

1. THE PHASES ; WHAT, WHY, HOW

What is constructivist information literacy learning?

Constructivist information literacy learning (CILL) is a new label for something familiar.

Information literacy is simply the ability to find, use, interpret and produce information effectively, and turn it into knowledge. Good learners have always been able to do this. With the explosion of information and increasing variety of information sources, resources and technologies, information literacy has become a prerequisite for learning and working in an information society.

Resource-based learning is the type of learning used to develop information literacy skills. Enquiry, experiential or generative learning use similar approaches. In this study information literacy learning has been used because many teachers associate resource-based learning just with school library-based projects.

Constructivism is an approach to learning which emphasises the learner's construction of knowledge.

Constructivist information literacy learning is interpreted in this study as finding, using, and producing information from a variety of information resources and sources, and turning this information into knowledge.

What constructivist information literacy learning is NOT!

Constructivist information literacy learning is NOT sending students to the library to 'look it up' for a 'project' where they copy, photocopy or download chunks of information and paste it up manually or electronically! The essence of constructivist information literacy learning is the ability to construct knowledge from information. This means filtering information it through the head, using thinking and many of the other eight essential skill areas of the NZ Curriculum Framework.It is intended to help the student to build cognitive control of the learning, not just technology skills, although these are a dimension of the learning.

Using the 10 propositions or 'props'

10 'propositions' for constructivist information literacy learning (CILL) are suggested. These translate into ten 'props' for teachers to use to help learners to:

. establish prior knowledge of topic
. authenticate learning
. establish ownership of learning
. define knowledge needs
. coach/monitor selection of information
. coach/monitor use of skills for working with information
. coach/monitor use of strategies for constructing knowledge
. monitor skills needed to produce and communicate knowledge
. monitor skills needed for summative self-assessment
. evaluate control of learning collaboratively

Each of these steps is an opportunity for the teacher to get and give feedback, and help shape the student's control of the learning goals, process and outcomes.

3

Reflection: the essence of constructivist learning

Students construct knowledge from information by thinking about what they are learning, why they are learning and how they are learning. The teacher's role as coach is essential:

- helping students to reflect on the process of transforming information into knowledge

- helping students to reflect on their effectiveness as learners.

2. CILL : model of Constructivist Information Literacy Learning

context/curriculum

CILL

control   coach

CORNERSTONES
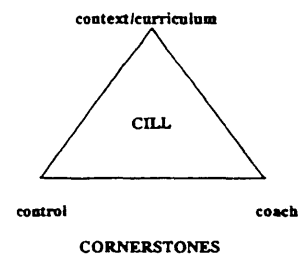
context/curriculum:

This acknowledges the learner at the centre of the learning.The learning is contextualized. The learner, the curriculum, the learning climate, available resources and technologies, the purpose for learning, the timeframe and the organization of the learning contribute to the context.

control:

This is the means as well as the end. The ultimate aim is to produce learners who can turn information into knowledge confidently and independently. Learners learn control by being given guided control - control is the guidance and direction to succeed, not the freedom to fail.

coaching:

Learner control is achieved through careful coaching and monitoring by the teacher. The teacher sets the student up for success by helping the student to plan the learning, undertake the learning and reflect on the learning. Coaching is provided as and when necessary. Different students have different coaching needs.

CONTEXT : narrative map

CONTEXT FOR PLANNING LEARNING

CILL LEARNING ENVIRONMENT
- complex
- authentic
- multi-sensory

knowledge of BEST WAY of WORKING
- needs, interests?
- likely journey?
- skills, evidence of skill, strengths and needs?

KNOWLEDGE OF LEARNERS
- individual?
- (past)
- (group)

- motivation, social dynamics?
- competence, levels, strengths?
- prior knowl, needs, coverage?
- previous P&L work?
- information other?

KNOWLEDGE OF CURRICULUM

TOPIC
- relevant?

RESOURCE
- rich, source, resources?
- (community, expert, sources?)
- rich, technology?
- help with access, retrieval, use?

- interesting?
- (range of location)

LEARNING CLIMATE
- (national)
- (school)
- (classroom)
- teacher-centred

HOW / WHAT

WAYS OF KNOWING

DOMAIN/SUBJECT KNOWLEDGE
- conceptualised structure & principle
- curriculum priorities & past experience
- prior knowledge & themes

STRATEGIC KNOWLEDGE
- knowing how to use skills, info, resources & info, technologies, strategically

KEY TERMS KEY IDEAS KEY QUESTIONS

HEURISTIC KNOWLEDGE
- how to

SELF-AS-LEARNER KNOWLEDGE
- use (KO?) self reflection
- cast, self efficacy - I feel; motivation
- plan, monitor, evaluate, self-regulation
- reflect on WHAT I learn; metacognition
- reflect on HOW I learn; metalearning

CONSTRUCTION KNOWLEDGE

REFLECTIVE CONVERSATIONS

- how to build knowledge from info, by analysing, synthesising, interpreting,
- how to create & communicate messages using media & info, technology

MONITORING (METACOGNITIVE) ASSESSMENT

provide opportunities for

TRANSFER

making links for

HELPING STUDENTS TO NEGOTIATE, AND PROVIDING OPPORTUNITIES FOR STUDENTS TO CONSTRUCT KNOWLEDGE FROM INFORMATION BY USING DIFFERENT TYPES OF KNOWLEDGE GUIDED BY REFLECTIVE CONVERSATIONS BETWEEN STUDENT AND COACH WHICH EMPHASISE METACOGNITIVE AND META LEARNING STRATEGIES

context/ curriculum : explanation

Planning for learning

The learner, the curriculum, the climate for learning, the available resources, technologies and time, and the teacher's values and priorities, all interact to establish the learning context, ie what the teacher is doing is not pre-planning *lessons* (or notional students, but planning *learning* for specific students and contexts. Central to this is the knowledge of the learner, and knowledge of the curriculum.

In CILL, influenced by the resource and climate factors, the teacher has to decide, in advance, what might be the best way of managing the learning (for her/himself) and the optimum way for the students to learn.

Context for learning

Essential to the contextualization of learning is the curriculum, defined as the WHAT and HOW of learning. And essential to CILL is the teacher's conscious attempt to ensure that, through opportunities to negotiate and through choice, students learn how to control the construction of their knowledge, and

- through modelling or coaching by the teacher or peers, students gain the strategic knowledge (knowledge of how to apply relevant skills, including all the skills of the NZ Curriculum [see p. 18] strategically in the learning process), as well as the

- heuristic knowledge (knowledge of how to enquire, how to 'interview' information, how to apply the heuristic or filter framework of key ideas/concepts, questions and search terms) in order to develop

- domain knowledge (knowledge of that topic within its wider subject area or discipline), and

- construction knowledge (knowledge of how to construct knowledge from information by using cognitive skills like critical thinking, metacognitive analysis, synthesis and interpretation, and to produce information by collating and communicating clear messages using appropriate media and technologies).

Through continuously being invited to reflect, individually and collectively, on how effectively they are using these skills to accomplish their learning purpose, students develop

- self-as-learner knowledge (awareness of their strengths and weaknesses as learners and managers of learning, self-efficacy, or knowing that they have the ability to do something, as well as self-esteem, or belief in themselves).

Context for reflecting

'Reflective conversations' is the name given to the dialogue between self-as learner, and between learner and coach, which may occur spontaneously at any time, but should occur at every checkpoint (see p. 10) or point where the teacher's monitoring indicates that the learner(s) may benefit from thinking about and outlining their process and what they intend to do next, seeking advice if needed.

Reflection is the interaction of monitoring, thinking about learning (metacognition) and continous assessment processes. It anchors learning and facilitates transfer.

6

Control: narrative map   STUDENTS LEARN TO CONTROL WHAT, HOW & WHY OF LEARNING

PLANNING
WHAT HOW

— in light of —

PRIOR KNOWLEDGE
- domain/ subject knowledge
- curriculum experience
- learning competence

in order to

DEFINE LEARNING TASK
- purpose, audience
- personal relevance
- curriculum relevance
- goals, timeframe
- problem/ knowledge needed

to determine

PLAN FOR LEARNING
- strategic approach to task
  . what to do
  . when, with whom
  . how, how much

SELF-AS LEARNER KNOWLEDGE   helped/ constrained by

RESOURCES
- information sources & resources
- help (peers, expert, coach)
- technology (skills, help to use)
- time

- RBL experience
- skill strengths, weaknesses
- attitude (persistence, motivation, confidence, independence, etc)
- group/ indiv. lrg preference   knowing how to use

LEARNING
WHAT
HOW
WHY

HEURISTIC FRAMEWORK
KEY TERMS for searching
KEY IDEAS, concepts, themes
KEY QUESTIONS, knowl. needs

FINDING INFO.   **SELECTING INFO.**

REFLECTING

INTERVIEWING INFO.
- LISTENING
- VIEWING   individually & collaboratively
- READING   to apply HEURISTIC F/WORK
- THINKING

· RECORDING INFO.
· REVISING NOTES   TO:
· ORGANISING INFO.

METACOGNITION METALEARNING reflective conversations

- compare, contrast
- analyse
- collate, interpret
- synthesize, summarize
- discuss, share, revise, add, amend
- key understandings, facts, opinions, ideas principles, etc

WORKING WITH INFORMATION USING SKILLS STRATEGICALLY AND METACOGNITIVELY

CONSTRUCTING KNOWLEDGE

ASSESS & EVALUATE

COMMUNICATING KNOWLEDGE
- audience
- purpose
- messages
- medium / technology?
  . wordprocessing
  . multimedia/ audiographics
  . database, hypercard
  . video, video/audioconference

Self-as-learner knowledge ·
Quality of knowledge ·
Quality of communication ·

(Articulate key facts, ideas, understandings, appropriately)

---

control : explanation

Planning

Students themselves need to plan their learning taking into account the same factors that influenced the teacher's planning. They need to consider the WHAT and the HOW of the learning.

They need to know:

- **WHAT** they are studying; its significance; its relevance; its relationship to prior knowledge and what they've done previously and what they'll do next (learning task)

- a clear overview of the learning task; what exactly are they learning; what will they do with it, for whom? (learning purpose)*

- how they will manage the learning in terms of time, groups etc (parameters)*

- what resources are at their disposal*

- **HOW** to gain an overview of the topic, see where they need to gain knowledge and describe it as a filter or heuristic framework of key concepts/ideas, key search terms and key questions*

- how to apply the heuristic Filter Framework to scanning information sources to find and select only that information which is relevant to their learning purpose and task*

- how to apply the heuristic Filter Framework to 'interview' the information, ie work with the information critically and selectively using:

  - listening, viewing, reading, thinking skills strategically

  to record information selectively, revise information selectively and organize information retrieved, to

  - compare and contrast, analyse, collate, synthesize, summarise information
  - discuss, share, revise, derive key understandings, facts, opinions, ideas, etc

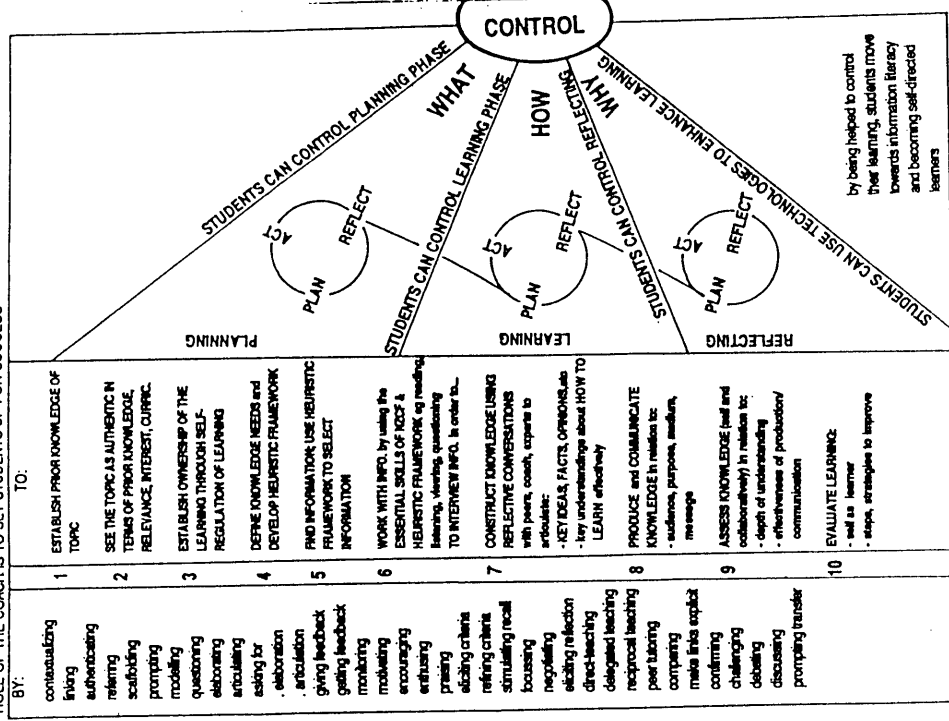* as much as possible achieved through negotiated choice

Reflecting

By having **reflective conversations** (with themselves, with peers, with coach), students use the heuristic filter framework to focus on the learning purpose, assessing and evaluating as they go, simultaneously filtering the information they retrieve to construct knowledge in their heads by filtering it through the Filter of key questions, concepts, etc. They are reflecting on the knowledge they are constructing (**metacognition**) and also about the learning process and their management of the learning (**metalearning**).

Ultimately their ongoing reflective conversations enable them to assess:
  - self-as-learner, ie effectiveness in using skills and strategies : self efficacy
  - quality of knowledge gained
  - quality of communication of that knowledge

8

coaching : narrative map

ROLE OF THE COACH IS TO SET STUDENTS UP FOR SUCCESS

CONTROL

WHAT — HOW — WHY

STUDENTS CAN CONTROL PLANNING PHASE
STUDENTS CAN CONTROL LEARNING PHASE
STUDENTS CAN CONTROL REFLECTING
STUDENTS CAN USE TECHNOLOGIES TO ENHANCE LEARNING

PLANNING — LEARNING — REFLECTING

PLAN — ACT — REFLECT (x3 cycles)

by being helped to control their learning, students move towards information literacy and becoming self-directed learners

BY:		TO:
contextualizing linking authenticating referring	1	ESTABLISH PRIOR KNOWLEDGE OF TOPIC
scaffolding prompting modelling	2	SEE THE TOPIC AS AUTHENTIC IN TERMS OF PRIOR KNOWLEDGE, RELEVANCE, INTEREST, CURRIC.
questioning elaborating articulating	3	ESTABLISH OWNERSHIP OF THE LEARNING THROUGH SELF-REGULATION OF LEARNING
asking for . elaboration . articulation	4	DEFINE KNOWLEDGE NEEDS and DEVELOP HEURISTIC FRAMEWORK
giving feedback getting feedback monitoring	5	FIND INFORMATION USE HEURISTIC FRAMEWORK TO SELECT INFORMATION
motivating encouraging enthusing praising	6	WORK WITH INFO. by using the ESSENTIAL SKILLS OF KD7 & HEURISTIC FRAMEWORK (eg reading, learning, viewing, questioning TO INTERVIEW INFO. In order to...
eliciting criteria refining criteria stimulating recall focussing negotiating	7	CONSTRUCT KNOWLEDGE USING REFLECTIVE CONVERSATIONS with peers, coach, experts to articulate: · KEY IDEAS, FACTS, OPINIONS,etc · key understandings about HOW TO LEARN effectively
eliciting reflection direct-teaching delegated teaching reciprocal teaching peer tutoring	8	PRODUCE and COMMUNICATE KNOWLEDGE in relation to: · audience, purpose, medium, message
comparing make links explicit confirming challenging debating	9	ASSESS KNOWLEDGE (self and collaboratively) in relation to: · depth of understanding · effectiveness of production/ communication
discussing prompting transfer	10	EVALUATE LEARNING: · self as learner · steps, strategies to improve

---

9

coaching : explanation

Central column

This shortens the 'role of the student in CILL' in the Full Framework on p.10. It shows that, while the teacher is aware that there are 10 'props' (and 10 opportunities for seeking and getting feedback from students), the students only need 3 recursive phases or dimensions to their learning, planning, learning and reflecting.

Right column

Their reflection obviously gathers momentum at the end when they are looking back and assessing (with self, peers and coach)
. the quality of their knowledge
. the quality of the communication of that knowledge
. themselves as learners (strengths, weaknesses and areas to improve).

However, the key point for the teacher as coach is that the planning, acting, reflecting dimensions are continuously recurring, and the teacher's role is to prompt this recursive approach on the part of the learner until it becomes habitual throughout the learning process. Reflection, as outlined on p. 3, is the essence of constructivist learning, and throughout each of the planning, learning and reflecting phases or dimensions they are being prompted to think about WHAT they are learning, the content, as well as HOW they are learning, the process, and WHY they are learning, the key ideas, themes, concepts, implicit values, attitudes, etc.

Left column

The coaching process is very much a matter (as is all teaching) of drawing on a repertoire of teaching/ facilitation skills and activities as appropriate for the particular learner(s), particular learning situation and particular teaching moment, and particular time in the term, week or learner's life. It is why teaching is a profession, not a pre-programmed automated response to particular stimuli. It is a complex process calling on flexible use of a repertoire of strategies used individually, or, more frequently, in combination. There are no doubt many more. These are just suggestions.

Whatever process is used, it needs to follow the CILL ground rules of encouraging learner control of the learning

• by making maximum use of negotiated choice and explaining the context of the learning, ie not just what skills/ strategies to use, but why and how they work;

• not just giving facts but explaining how they relate to the curricular or domain knowledge (wider subject or discipline) context, and

• using 'reflective conversations' to encourage the recursive planning, learning, reflection loops discussed above

Constructivist Information Literacy Framework (CILL)

The role of the teacher is to CONTEXTualize the learning within the NZ curriculum and to set students up for successful CONTROL of the learning by COACHing them

STUDENTS

CONTROL PHASES/ DIMENSIONS OF LEARNING

- WHAT - planning the learning
- HOW - using CILL strategies to work with info.
- WHY - transforming info. into knowledge by reflecting, analysing, discussing

[being helped through coaching to]

- work out what they know, and work with that prior knowledge (categorize it, see it in terms of key areas or themes, sets and subsets)

- understand how it relates to the formal curriculum
    - what they've done before
    - what they'll do next

- work out what they'll need info. on - not questions - areas of knowledge they need to find out / research

- work out what they are going to 'do' with it :
    - what might they produce, for whom?

- work out how long they have got, and how best to work (individually, pairs, groups).

- work out WHY this topic is worth while learning about
    - key ideas, concepts, principles
and what they need to find out
    - key questions
and what they'll need to interview/ look up info.
    - key terms and search words
[HEURISTIC FRAMEWORK]

- work out where they could go for information:
    - people, organizations as info. sources
    - print/ electronic info. sources

- work out a route map and timeframe

- work out what they can do eg use phone book, catalogue CD Rom Internet

- work out where they need help

- work out whether these are the best sources, and whether they have been used effectively to get the information needed?

- work out how to use the info. resources and interview them to record info. selectively, using the heuristic framework (key ideas, terms, questions etc)

- work out the best way of recording only that info. relevant to the heuristic framework (key ideas, etc)

- work out how to construct knowledge using reflective conversations to develop metacognitive and metalearning knowledge and to articulate:

    - key understandings, facts, ideas, opinions, principles (in line with curriculum)

    - key understandings about how to learn effectively from complex info. resources.

- work out how to produce & communicate knowledge in relation to
    - audience, purpose for learning,
    - messages
    - media & technologies available

- work out how to assess knowledge in relation to:
    - depth of understanding
    - effectiveness of knowledge produced/ communicated in relation to purpose

- work out how to evaluate learning in relation to
    - self-as-learner / self-efficacy
    - strategies for improving learning

(circles labelled) WHAT? HOW? WHY? — PLAN / REFLECT / ACT — constantly looping back

TEACHER AS COACH

The complexity of the learner's role in Constructivist Information Literacy Learning (CILL) becomes obvious when you break down the three simple phases or dimensions:

- **WHAT** - planning learning
- **HOW** - learning
- **WHY** - reflecting on learning

into what learners need to do.

It becomes clear that, without the help of a coach, few students will be successful.

INFORMATION LITERACY LEARNING is a process of learning to learn. The coach plans learning not lessons.

The coach PLANS how to give students guided control and choice through the ten props.

The coach PLANS the same WHAT, HOW and WHY phases or dimensions.

- Plans the WHAT, contextualized
    - within student's prior knowledge
    - within curriculum needs
    - within students' learning abilities & interests

- Plans the HOW
    - within student capabilities
    - beyond student capabilities (through coaching)
    - giving choice, control
    - building self-as-learner knowledge and self-efficacy

- Plans to COACH the HOW
    - ensures that each student identifies the knowledge needed (in relation to prior knowledge, curriculum outcomes, etc)

    - ensures that each student develops a heuristic framework:
        - key ideas/ concept
        - key search terms
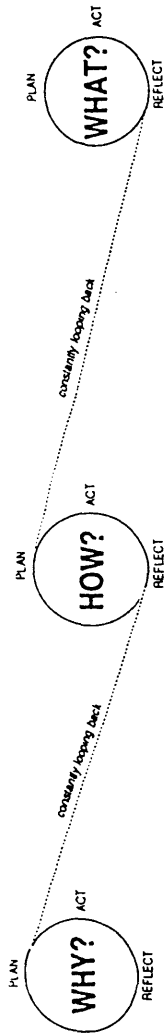   - key questions

    - ensures that each student uses skills consciously to interview information

    - ensures that each student uses info. selectively and analytically to turn info. into knowledge, ie works on the info.

- Plans the WHY
    - to help students to monitor and reflect on their learning

    - to help students to develop
        - criteria to assess their learning (content)
        - criteria to assess their learning (process)

'PROPS'

Sidebar: **How are you going to help them to...**

1 ESTABLISH PRIOR KNOWLEDGE through
- brainstorming mapping
- questioning discussing
- get and give feedback

2 AUTHENTICATE LEARNING by:
- making links to previous/current curriculum learning
- making links to prior knowledge
- encouraging interest through discussion, input etc
- get and give feedback

3 ESTABLISH OWNERSHIP OF LEARNING
- negotiate strategic planning of learning
    - goals purpose audience
    - timeframe, process roles
    - checkpoints, stages
- get and give feedback

4 DEFINE KNOWLEDGE NEEDS
- negotiate heuristic framework
    KEY ideas/ concepts
    KEY search terms
    KEY questions
- establish knowledge needs in light of domain/ curriculum criteria
- establish appropriate info. sources resources. technology, access & help
- get and give feedback

5 COACH/ MONITOR SELECTING INFO.
- use of retrieval technologies & tools
- use of heuristic framework to
    - scan info sources resources
    - analyse, select /reject info
    - record selectively
- get and give feedback

6 COACH/ MONITOR SKILLS FOR WORKING WITH INFORMATION
- use of heuristic framework to
    - interview information by
    - reading listening viewing
    - thinking & analysing

7 COACH/ MONITOR STRATEGIES FOR CONSTRUCTING KNOWLEDGE
    metacognitive strategies: use of reflective conversations to establish
    - key understandings
    - key facts, ideas, themes
    - key opinions, premises, arguments
    - key causes, effects, solutions
    metalearning strategies
        - self-regulated learning
        - self-efficacy
- get and give feedback

8 COACH/ MONITOR SKILLS TO PRODUCE & COMMUNICATE KNOWLEDGE in relation to
    - audience, learning purpose
    - medium (technology?)
    - messages (curriculum?)
- get and give feedback

9 COACH/ MONITOR SKILLS FOR SUMMATIVE SELF-ASSESSMENT
    - learning outcome & process
    - domain/curriculum criteria

10 CO-EVALUATE CONTROL OF LEARNING
    - self-regulation (management)
    - self-efficacy (perceived ability)
    - attitude to learning
    - articulation of goals as learner
    - get and give feedback

12

applying the CILL Framework

The complexity of the learner's role in constructivist information literacy learning becomes obvious when you break down the 3 simple phases, ie
- **what**: planning the learning
- **how**: learning
- **why**: reflecting on learning
into what learners need to do (see full framework, p. 10).

It becomes clear that, without the help of a coach, few students will be successful.

Information literacy learning is a process of learning to learn. The coach plans **learning, not lessons**.

The coach **plans** how to give students **guided control and choice** through the three phases (what, how, why) and the teacher's ten steps.

The coach **plans** how to get and give feedback so that students are helped to plan, monitor and evaluate their learning **formatively**.

The coach **plans** the same **what** (planning the learning), **how** (monitoring and coaching the learning process) and **why** (ensuring that students reflect) phases, thinking them through **from a learner's perspective**, trying to anticipate the pitfalls and potholes and to anticipate the learning skills and strategies they need to succeed.

Planning the learning:

The CILL Framework acknowledges what we know from research :

> that experienced teachers do most of their planning in their heads

> that most teachers do not start with objectives or outcomes and then design learning experiences or activities

> that most teachers start from activities they want to do with their students because they 'work'; learning outcomes develop retrospectively

> that, even when they work from formal plans, most teachers interpret them flexibly, adjusting them to learners and whatever is happening at the time.

The CILL Framework does not impose any particular way of planning, or teaching. It provides questions to prompt you to think about guiding the planning, learning and reflection.

Planning the learning, coaching and helping learners to reflect are the non-negotiable cornerstones of constructivist information literacy learning. Without these three cornerstones, it may well be learning, but it will not be constructivist information literacy learning.

However, **HOW** you go about doing the planning, etc, is up to you. It can be as formal or informal as you want. All that you are asked to do is to think through the three phases (planning the learning, coaching the learning, and helping learners to reflect) using the questions that follow. Try to think them through in as concrete a way as possible, imagining that you are one of your learners undertaking the process, and trying to see the learner's progress in your mind's eye (or the TV screen in your head). Try to see what **you** will do, and what the **learners** will do, and **how** ...

13

PLANNING THE LEARNING : logistics and management...

These question prompts may help you to contextualize the CILL learning for students:

- How much time have you got?

- • What have you got to cover - content/skills? School/ syndicate scheme? Departmental plan? NZ Curriculum achievement objectives? NZQA unit standards?

- How have you taught it previously? What did you have in mind?

- Are you sure CILL is a suitable way for students to learn this topic?

  NOTE: If the concepts are very abstract, or if students know absolutely nothing about it, some direct teaching, some demonstration or experiment may be more suitable than CILL. The best topics for CILL are fact-rich, information-rich, relevant and strongly conceptual, ie when there is plenty of information available to support the learning and where there are strong ideas, messages or themes to deduce, infer, and explore from the information so that most students will enjoy constructing their own knowledge from the information and see it as relevant.

- Have your students done this sort of learning with you before? Do you have an idea of their level of expertise? Is what you are planning realistic in terms of their (known or unknown) capabilities? Is it realistic in terms of the size and complexity of the topic you had in mind?

  NOTE: If students have done many 'projects' previously, it may not help, and may, in fact, be a hindrance, because many get into project mode (develop a question, find some information and paste it up) and do not want to accept more **cognitive** responsibility for constructing knowledge. It is ALWAYS preferable, given the complexity of the student's role (see Full Framework (p.10) to start with a small topic or aspect of a topic so that you and they can concentrate on the **quality** of the learning, ie go for depth not coverage).

- Can you visualize the resources that you'd expect your students to use for this topic: people, print, electronic, community-based, library-based, classroom-based?

  NOTE: Try to think of specific resources, and consider the logistics (access, cost). It may be worth doing some investigation before you go further.

- Have you thought about the optimum way of working for this group of students - individually, pairs, teams? Have you thought through the implications for you as coach? Will you be able to get round the groups/ individuals if they need coaching? How will you know whether they do? How could you set them up to be self managing and still provide coaching/ feedback/ guidance as needed?

  NOTE: have a look at the Full Framework on p.10 at the 10 checkpoints where you may want to get and give feedback. You may find it helpful to try to visualize it in your head, seeing where the groups/ individuals are and what they are doing (or not doing!), seeing how you confer with them, seeing how you ensure that they have the skills and management strategies for the next stage, whatever... Does the video in your head show students in control and you as the 'guide on the side' knowing: where everyone is and knowing that you have ascertained that they have the skills and strategies to do whatever they are doing successfully?

14

How can you help students plan and own their own learning:

The essence of CILL is helping students to learn to control their learning. **Contextualization, authentication and ownership** (props 1-4) of learning are established at the start by helping students to **plan their own learning**. These question prompts are to help you consider how you can help students to plan their learning within the parameters you establish.

- How are you going to help your students to work out what they already know on the topic in relation to what they are going to learn; contextualize their knowledge?

  NOTE: Mapping, webbing, looking for sets and subsets, themes, sharing knowledge and comparing key ideas are useful strategies for ensuring that students recognize that learning builds on existing knowledge.

- How are you going to ensure that your students understand how this existing knowledge relates to the curriculum, what's been done before and what's next?

- How are you going to help your students identifying gaps - areas where they'll need to find out more and expand their knowledge?

- How are you going to help them to establish what they'll do/produce with their knowledge, for whom? How are you going to help them to keep it realistic and achievable within the time/ resources available?

- Will they be able to work collaboratively in teams? If so, how will you ensure that the focus remains on **knowledge construction** ? How will you ensure that the medium chosen is compatible with the purpose/ objectives of the learning?

  NOTE: It may be better to offer students choice within the parameters which you identified (time, supervision, assistance, access to resources, see p. 13) than total freedom which may lead to failure if the criterion is **quality** of learning rather than quantity of information retrieved.

- How will you help **them** to determine whether what they want to produce is manageable in the time available, work out a route map and timeframe? How will you get them to plan and manage their time?

- How will you help them to determine whether they have the required skills, or where and how they will need help? Can they visualize themselves going through the route map, seeing where they are OK and where they may have problems?

- How will you help them to construct a filter, or heuristic framework to help them to find and use information selectively, and to use to filter the information through their heads to turn it into knowledge?
  - key ideas/ concepts/ principles (why is this topic important/ worth learning?)
  - key search words/terms (key interview or 'look up' terms for key aspects)
  - key questions (a network of Qs from the gap areas and containing key words)

- How will you help your students to work out where they could go for information? What **specifically** would they do to find people or organizations to help them? How would they find material on the CDRom, on the Internet? How would they find material in a library? What **exactly** would they look up, how?

  NOTE: Whether students are using print or technologies involves knowing where to look, knowing how to look and knowing what to look for.

15

How will you coach the learning?

The term 'coach' is used to signify the relationship of the teacher in monitoring the learning (props. 5-8) continuously, helping proactively. The coach helps students to work out what they need to know and do at each stage of the learning, and assists them to get the knowledge and skills from each other, or from you or elsewhere. It is a proactive role of facilitation, monitoring, getting and giving feedback, and responding to spoken and unspoken needs as and where they arise, ie coaching is embedded in the learning process. The question prompts are intended to remind you of this proactive, ongoing and embedded nature of coaching.

- How will you ensure that students 'own' the learning so far, find it relevant and authentic?

  NOTE: If they don't, there may be little point in proceeding with CILL which is time consuming and dependent on student motivation. It may be worth cutting your losses and doing some direct teaching and trying again later?

- How will you help students to work out whether these are the **best/ most appropriate** sources of information in relation to the nature of the topic and the purpose of their learning, and whether they have been used **effectively** to yield the information they contain?

- How will you help your students to work out how to use the resources, to skim and scan them for relevant information using the Essential Skills of the NZ Curriculum Framework (see p. 19) and using the heuristic or Filter Framework to get the gist or build up an overview of the information ?

- How will you help your students to apply their heuristic or Filter Framework to 'interview' by reading, listening, viewing and thinking more critically, using the Filter Framework to look for relevant material, ideas, facts?

- How will you persuade them to record only relevant information, and in the most appropriate way?

  NOTE: This may be on a database, using video or ordinary camera, tape recorder, sketches, etc. This may involve two stages, ie taking notes in the form of lecture notes, photocopies, etc and then **making notes from the notes taken**, which involves using the Filter Framework to select, collate and interpret.

- How will you help your students to work out how to construct knowledge using 'reflective conversations' (see p.6) with peers, coach, experts, to articulate:
  - key understandings, facts, opinions, ideas, principles (in line with curriculum requirements)?
  - key understandings about how to learn effectively from complex information sources and resources and get the best information (quality not quantity)?

- How will you help your students to work out how to produce and communicate knowledge in relation to:
  - audience and purpose for learning?
  - messages, key ideas and content?
  - media and technologies available?
  - help available, if needed, to use these media and technologies?

glossary

These terms have been defined as they are used in the context of this study. They are listed in the order in which they appear in the Cill Framework Teacher Booklet

Constructivism : an umbrella term interpreting learning as the construction of knowledge - an active, reflective, process emphasising student-centredness/ student control of the learning process

Information literacy: the ability to find, use, analyse and produce information effectively, and turn it into knowledge

Resource-based learning : learning based on the effective and efficient use of resources (people, organisations, print, electronic, media, etc). Subsumed under this term is the expectation that, in order to find, use, etc. information, the learner will have effective information and communication technology skills. This is seldom stated explicitly, but, on the other hand, much of the literature on computers and IT in learning assumes that the ability to use the technology is synonymous with learning. In my thesis I am suggesting that information literacy it, in fact, achieved through resource-based learning and technology-based learning as they have been traditionally used in the literature.

Learning environment : here it is used to support the claim that learning is communicated - teachers design CILL learning environments, not lessons, and in this sense it represents the balanced relationship of several variables - the learner, the curriculum, the learning climate or rules, the available resources (including technologies) and the available time.

Domain knowledge: here it represents knowledge of the wider subject discipline, is how a particular topic relates to the whole discipline

Strategic knowledge : here is represents knowledge of how to use cognitive and technological skills strategically within the learning process. In other words, it seems that skills taught on standalone skills programmes ARE learned but not used because students don't appear to know how to, or see the need to, use them in the context of actual learning.

Heuristic knowledge : here it represents knowledge of how to acquire how to conceptualise problems and knowledge and seek for the information/solution.

Self-as-learner knowledge : here it signifies a complex interaction of knowledges the learner has a bout her/himself as a learner - self esteem (I am), self-efficacy (I can), motivation (I will), self-regulation (I plan, monitor and evaluate), metacognition and mentalearning (reflecting on learning content and process - the what and why of learning).

Construction knowledge : here it means how to work with information to build it into knowledge - analysing, synthesising, summarising, discussing, interpreting, developing key understandings, opinions, etc. and using communication and information technologies and skills to produce and communicate information.

Reflective conversations : used in the sense of the dialogue between self-as-learner, between learner, learning colleagues and coach at every stage of the learning process. In the CILL Framework reflective conversations are seen as a key strategy for encouraging students to think, learning, and analyse what they are doing throughout the process and, at very least, at each of the ten checkpoints between the Props.

Reflection : used here as a more accessible (to students) shorthand term for metacognitive (thinking about the learning content, issues, etc) and mentalearning (thinking about the learning process and self regulation or management of the learning: in short, thinking about the WHAT, HOW and WHY of learning during the learning and after the learning. As such, reflection is also a tool in assessment and evaluation of learning.

How will you guide the reflecting?

As suggested on p.3, reflecting is the essence of CILL. Reflection is ongoing - students need to be helped to consider WHAT they are learning (the content, concepts) and HOW they are learning (the process) as they are learning it.

Reflection is the essence of how students learn to control their learning.

PLANNING, LEARNING and REFLECTING are cyclical and recursive, and students need to be prompted until the use of the reflective cycle and reflective conversations with themselves and with peers and the coach becomes a habit that feels natural.

The HEURISTIC FRAMEWORK (key concepts, key search terms, key questions) is one of the most valuable devices for focusing reflection on the content (what) and process (how) of the learning.

With the CILL focus on knowledge construction, it is particularly important for students to be involved in developing criteria for assessing the quality of the knowledge they have constructed. This, obviously, cannot be done at the start when, reasonably, they may know very little about the topic, so it MUST be done with the assistance of the teacher *throughout* the process. Students must be encouraged to think about the knowledge they are building, to relate it to their original knowledge, to relate it to their heuristic frame and the overview of the topic and domain (see p. 14).

The following prompts relate particularly to props 9 and 10, but also to each of the previous 8 props. The checkpoints marked on the Full Framework (p.10) indicate where teachers may choose to seek and provide feedback, and through this, to monitor and guide the extent to which the student is thinking about building the knowledge (METACOGNITION) and think about themselves and learners and how they are managing the learning, managing their time and their resources (METALEARNING):

- How will you get your students to develop criteria for assessing the quality of the knowledge they build as they build it (self- and peer assessing)?

- How will you get your students to assess knowledge (individually, with peers, with coach) in relation to:

  - depth of understanding (key ideas, concepts, principles, facts)

  - effectiveness of knowledge produced/ communicated (messages, audience)

  - media and technologies available

- How will you get your students to evaluate their learning in relation to

  - self-as-learner knowledge (strengths, weaknesses, habits, self-efficacy and self esteem, motivation)

  - specific strategies for improving learning

The Essential Skills : Nga Tino Pukenga

The Essential Skills

The New Zealand Curriculum specifies eight groupings of essential skills to be developed by all students across the whole curriculum throughout the years of schooling. These categories encompass other important groups of skills, such as creative skills, valuing skills, and practical life skills.

All the essential skills are important if students are to achieve their potential and to participate fully in society, including the world of work. In planning learning programmes, schools need to ensure that all students have the opportunity to develop the full range of essential skills to the best of their ability.

The categories are simply convenient labels for grouping the essential skills and attributes which all students need to develop. These skills cannot be developed in isolation. They will be developed through the essential learning areas and in different contexts across the curriculum. By relating the development of skills to the contexts in which they are used, both in the classroom and in the wider world, school programmes will provide learning which students can see to be relevant, meaningful, and useful to them.
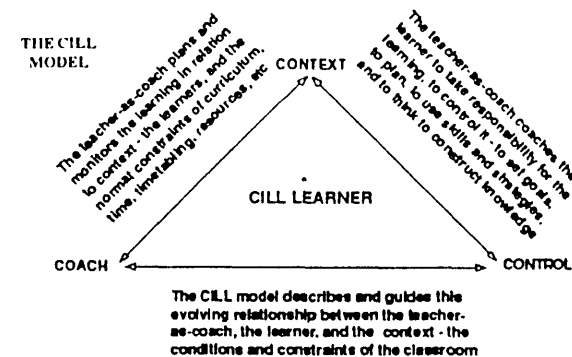
A number of the essential skills may be developed through group activities. Furthermore, many of the skills will enable individuals to operate more effectively in group situations. Students will learn to work in co-operative ways, and to participate confidently in a competitive environment.

The curriculum will challenge all students to succeed to the best of their ability. Individual students will develop the essential skills to different degrees and at different rates.

CILL FRAMEWORK

A framework for constructivist information literacy learning
(CILL) in New Zealand

The purpose of the CILL Framework is to help students with learning that involves finding and using information to develop understanding and construct knowledge.
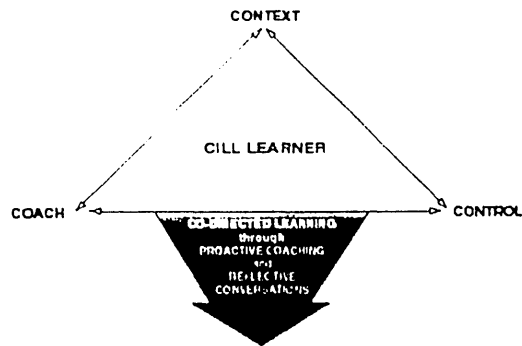

THE CILL MODEL

CONTEXT

CILL LEARNER

COACH

CONTROL

The CILL model describes and guides this evolving relationship between the teacher-as-coach, the learner, and the context - the conditions and constraints of the classroom

The **CILL Framework** builds on the CILL Model. It works like a menu. Teachers identify an area of learning - it could be how students ask questions, make notes from books or Encarta, how well they write essays or design multi-media presentations, or 'do' a whole research or enquiry project.

There are **ten 'props'** or propositions which say that to find and use information to construct knowledge students must, for example, 'own' the learning, establish prior knowledge, etc. These 'props' represent dimensions of CILL learning. Each has guidelines and prompts or suggestions for strategies, and each is planned, coached and monitored.

Two of the 'props' (9 and 10) underpin and run alongside the other eight props. These help to translate the 'coach' metaphor into concrete teaching strategies, emphasising '**proactive coaching**', or ensuring that learning strategies are negotiated *before* the learning (prop 9 on page 7)), and **co-evaluation** or collaborative, ongoing, prop-by-prop evaluation through **reflective conversations** by coach and students (prop 10 on page 8).

CILL is not a formula or a recipe! It helps to think of it as a menu. The 'props' are dishes, the prompts lists of ingredients. Teachers select what they want, combine dishes and ingredients, and loop backwards and forwards using whatever happens to relate to the learning students are currently engaged in.

Left Panel

CONTEXT

CILL LEARNER

COACH

CONTROL

CO-DIRECTED LEARNING
through
PROACTIVE COACHING
and
REFLECTIVE CONVERSATIONS

Few learners have, or choose to use, the cognitive and self- management skills needed for successful self-directed learning.

Co-directed learning is what results when the teacher-as-coach works with the learners to ensure that:
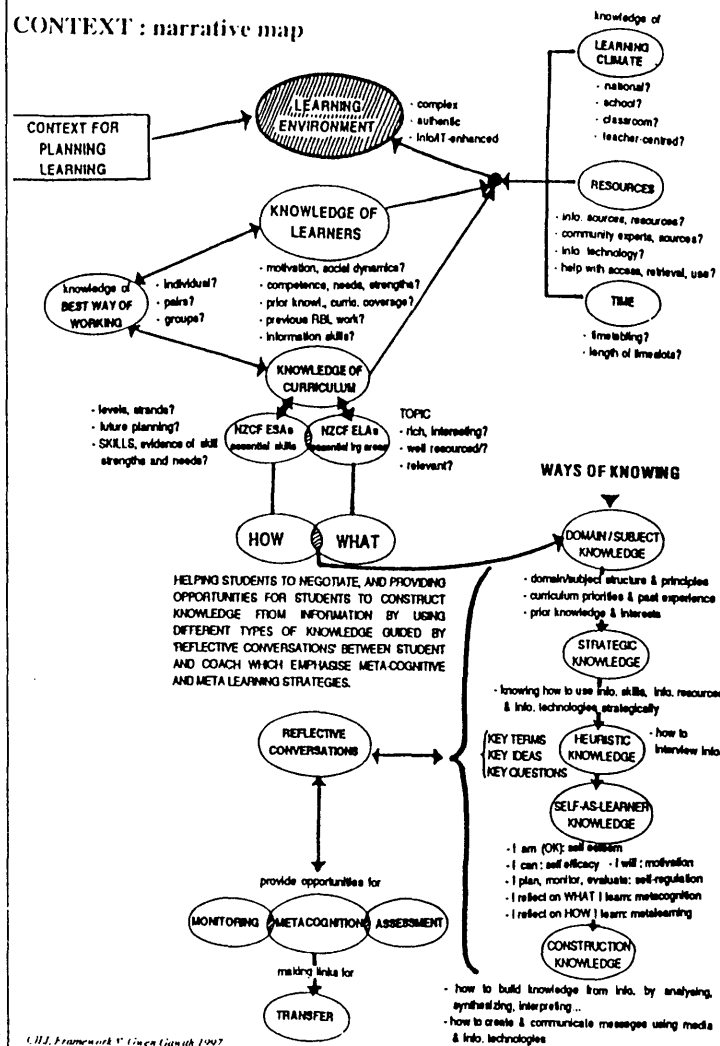
• before each learning phase the learners negotiate with the coach WHAT they are doing, for whom, why, and how they will go about it . They work with the coach to set learning goals and criteria, plan the learning, and describe/ demonstrate the skills and strategies they will use.

• during the learning they are helped to monitor and reflect. The teacher-as-coach uses reflective conversations (p.8) to ensure that learners think about the quality of the learning they are doing - the learning product or content knowledge gained, as well as the process.

• after the learning, reflective conversations with coach, peers, themselves, help consolidate WHAT has been learnt, what it meant, how it expanded their knowledge of this curriculum area, WHY it is important/ interesting/ valuable, HOW well they handled the learning, what they felt about it.

The point is that most students only undertake these cycles of planning, monitoring and evaluating learning if teachers *design* the structures, materials and supports which promote it and *coach* and *monitor* the learning proactively.

CILL designs the teacher-as-coach back into the learning because co-directed learning is seen as the best way to achieve the ultimate goal of self-directed lifelong learning.

Middle Panel

CONTEXT : narrative map

CONTEXT FOR PLANNING LEARNING

LEARNING ENVIRONMENT
- complex
- authentic
- Info/IT-enhanced

knowledge of

LEARNING CLIMATE
- national?
- school?
- classroom?
- teacher-centred?

RESOURCES
- info. sources, resources?
- community experts, sources?
- info. technology?
- help with access, retrieval, use?

KNOWLEDGE OF LEARNERS
- motivation, social dynamics?
- competence, needs, strengths?
- prior knowl., curric. coverage?
- previous RBL work?
- information skills?

knowledge of BEST WAY OF WORKING
- individual?
- pairs?
- groups?

TIME
- timetabling?
- length of time slots?

KNOWLEDGE OF CURRICULUM

- levels, strands?
- future planning?
- SKILLS, evidence of skill strengths and needs?

NZCF ESAs (essential skills)   NZCF ELAs (essential lrg areas)

TOPIC
- rich, interesting?
- well resourced/?
- relevant?

HOW   WHAT

HELPING STUDENTS TO NEGOTIATE, AND PROVIDING OPPORTUNITIES FOR STUDENTS TO CONSTRUCT KNOWLEDGE FROM INFORMATION BY USING DIFFERENT TYPES OF KNOWLEDGE GUIDED BY REFLECTIVE CONVERSATIONS BETWEEN STUDENT AND COACH WHICH EMPHASISE META-COGNITIVE AND META LEARNING STRATEGIES.

REFLECTIVE CONVERSATIONS

provide opportunities for

MONITORING   METACOGNITION   ASSESSMENT

making links for

TRANSFER

WAYS OF KNOWING

DOMAIN / SUBJECT KNOWLEDGE
- domain/subject structure & principles
- curriculum priorities & past experience
- prior knowledge & interests

STRATEGIC KNOWLEDGE
- knowing how to use info, skills, info, resources & info. technologies strategically

HEURISTIC KNOWLEDGE
KEY TERMS
KEY IDEAS
KEY QUESTIONS
- how to interview info.

SELF-AS-LEARNER KNOWLEDGE
- I am (OK): self esteem
- I can: self efficacy   - I will : motivation
- I plan, monitor, evaluate: self-regulation
- I reflect on WHAT I learn: metacognition
- I reflect on HOW I learn: metalearning

CONSTRUCTION KNOWLEDGE
- how to build knowledge from info. by analysing, synthesizing, interpreting ...
- how to create & communicate messages using media & info. technologies

Right Panel

There are several terms which need to be understood to explain CILL:

Control: This is shorthand for the skills and strategies students need to take responsibility for, to control this kind of learning. It includes learning skills like the Essential Skills of the NZ Curriculum that are cognitive, and the skills needed to manage, monitor and evaluate learning (goal setting, planning, managing time, etc), and the skills for reflecting on the learning process and product (metacognition and metalearning skills)

Co-directed learning: This was expanded on page 3. In short, it means that CILL is NOT self-directed learning. In CILL the teacher- as-coach and the student work together to co-direct the learning.

Coach: This teacher-as-coach metaphor is expanded on page 6. It is used to depict coaching as a role-within-a-role for the teacher. The CILL teacher-as-coach uses three main strategies:
• proactive coaching
• reflective conversations
• designing the learning context
These strategies are useful for all teaching, but they are *essential* to the CILL model. They are outlined below and on pages 6 - 9.

Pro-active coaching (Prop 9): This is expanded fully on p. 7. A lot of our normal teaching is re-active. We get and give feedback to students *after* they have done a learning activity. Pro-active coaching puts more emphasis on getting them to say what they are going to do, and how, BEFORE they do it. The coach can do some modelling or direct teaching and give advice before the learning, and should ensure that students have planned the next phase of their learning and negotiated criteria to describe what would be a good product from the learning, and a good process.

Reflective conversations: This is the key tool the teacher-as-coach uses for proactive coaching and **collaborative evaluation (Prop 10).** Prompts (p.8) spark reflective conversations. This is the tool the coach uses to get students to evaluate their learning BEFORE it has happened, DURING and AFTER. Reflective conversations can also be with peers or 'experts'. They are what promotes metacognition and metalearning, thinking about the WHAT and the WHY and the HOW of learning.

Designing the learning context: This is expanded on page 9. It describes the idea that the more the CILL coach thinks through every dimension of the learning IN ADVANCE the better prepared they will be for coaching the learning. Context is the third point of the CILL model because the learner's control of the learning and the teacher's coaching are critically influenced by the context that exists to support the learning. This supports the notion of thinking through the context - the nature of the students as learners and their learning competencies, the available resources, how to authenticate the learning, how to motivate the students, the nature of the topic and the desired curriculum outcomes, etc. It replaces the notion of paper-based lesson plans with the idea of the teacher-as-coach thinking through the learning processes the students will undertake - planning LEARNING rather than teaching.

Teacher-as-coach

Possible strategies:

PROACTIVE COACHING
Setting students up for successful control of their learning

REFLECTIVE CONVERSATIONS
Ensuring that these happen on an ongoing basis. They are the HOW of co-monitoring and self-monitoring.
Learners need to be taught to talk reflectively to teachers, peers and themselves. Likewise, **reflective conversations are the HOW of formative and summative self-evaluation and co-evaluation.**

DESIGNING THE LEARNING CONTEXT (see p. 7)

Focus on designing in these reflective conversations as checkpoints where you conference with groups and coach them to hold these **reflective conversations** at checkpoints throughout the process.

Forget lesson plans. Plan, think about, document and analyse the learning continuously. Plan by thinking it through as if you were one of the learners.

The teacher-as-coach infuses **Props 9 and 10** into the other 8 props, emphasising:

- **asking learners to say and SHOW what they will do, and how they will do it**
- **modelling, demonstrating, advising**
- **COACHING**
- **working WITH**
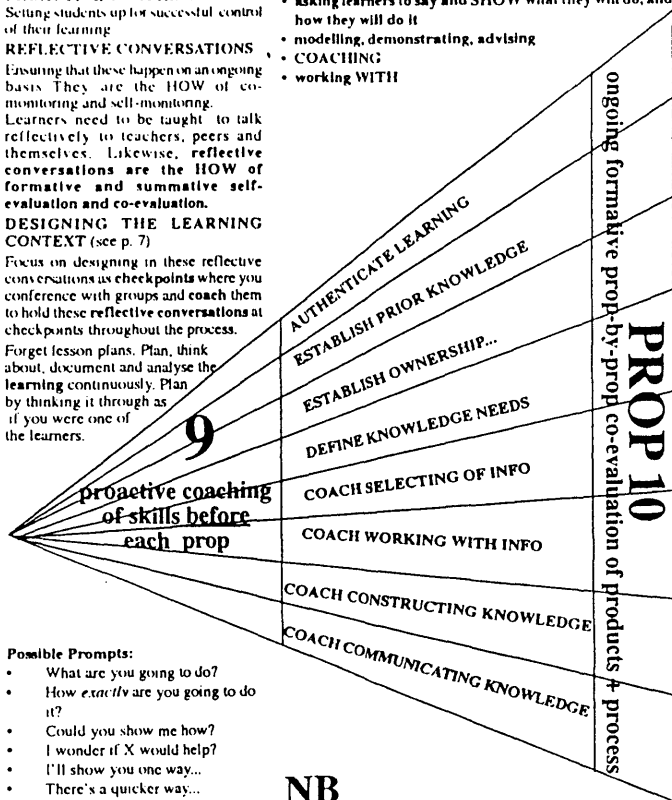
Possible Prompts:
- What are you going to do?
- How *exactly* are you going to do it?
- Could you show me how?
- I wonder if X would help?
- I'll show you one way...
- There's a quicker way...
- How do you see it linking to...?
- How do you see it as being relevant/ interesting/important?
- What will you do next?
- What will you do if it doesn't work, for example, if you can't find any information on your topic?

CILJ Framework © Gwen Gawith 1997

AUTHENTICATE LEARNING
ESTABLISH PRIOR KNOWLEDGE
ESTABLISH OWNERSHIP...
DEFINE KNOWLEDGE NEEDS
COACH SELECTING OF INFO
COACH WORKING WITH INFO
COACH CONSTRUCTING KNOWLEDGE
COACH COMMUNICATING KNOWLEDGE

9

proactive coaching of skills before each prop

ongoing formative prop-by-prop co-evaluation of products + process

PROP 10

NB

THE STRATEGIES USED BY THE TEACHER-AS-COACH ARE THE SAME FROM PRIMARY TO TERTIARY - JUST APPLIED TO SIMPLE/ MORE COSOPHISTICATED CONTENT AND CONTEXTS, AND EXPRESSED IN SIMPLER/ MORE COMPLEX LANGUAGE

Proactive coaching

Possible strategies:

Design the learning with clear steps, stages, phases.

Design checkpoints before significant stages.

Ensure students know what these checkpoints are for and establish procedures, ie

TELL them that you want them to think through and prepare beforehand, and HOW they should do this preparation - verbal, written, individual, negotiated by group.

Make sure they have an overview of the whole process.

Make comparisons between the role of a sports coach and your role in coaching learning. Ensure they have a game strategy and teach (hands-on, by showing, not telling) the skills they need to win the game of learning.

The teacher-as-coach tries to set students up for success in controlling the learning at each phase of the learning.

The teacher-as-coach plans by thinking through how students will learn and where they might need coaching IN ADVANCE of the whole process, and stage-by-stage.
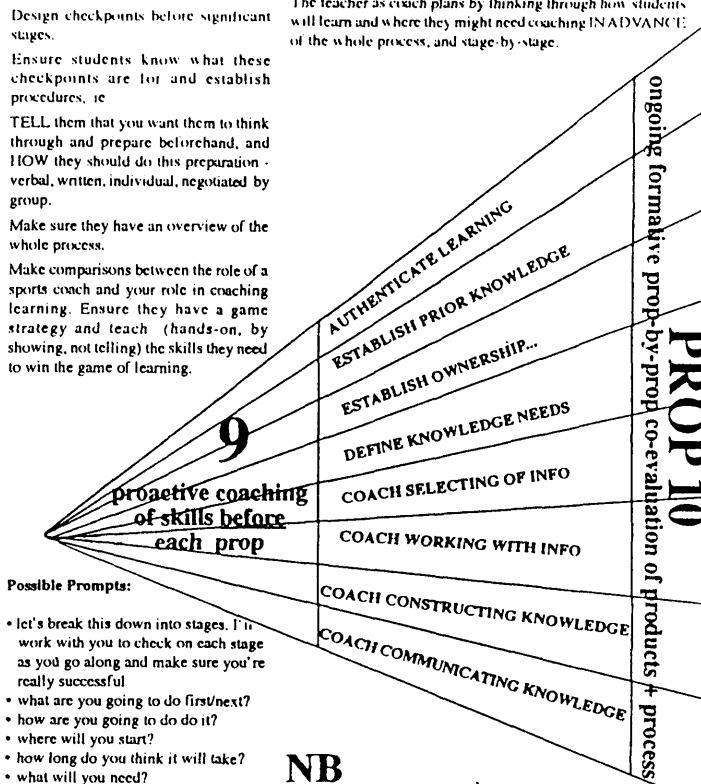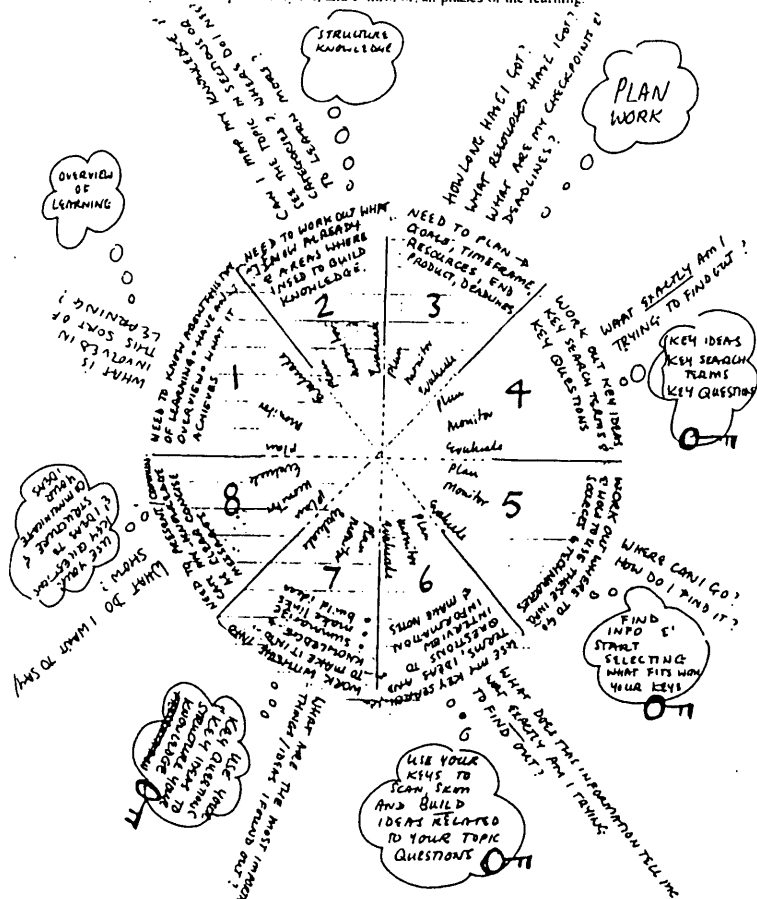
Possible Prompts:
- let's break this down into stages. I'll work with you to check on each stage as you go along and make sure you're really successful
- what are you going to do first/next?
- how are you going to do do it?
- where will you start?
- how long do you think it will take?
- what will you need?
- are you confident about doing it or do you need some help?
- tell me what you're aiming for? How much? What sort?
- can you see yourself in your mind's eye doing this? How?

AUTHENTICATE LEARNING
ESTABLISH PRIOR KNOWLEDGE
ESTABLISH OWNERSHIP...
DEFINE KNOWLEDGE NEEDS
COACH SELECTING OF INFO
COACH WORKING WITH INFO
COACH CONSTRUCTING KNOWLEDGE
COACH COMMUNICATING KNOWLEDGE

9

proactive coaching of skills before each prop

ongoing formative prop-by-prop co-evaluation of products + process

PROP 10

NB

THE SAME STRATEGIES AND PROMPTS APPLY AT JUNIOR LEVELS, BUT THE COACH DOES FAR MORE MODELLING AND COACHING, eg "Let's design some stages. First we could... What else could we do? Next we could... How long do you think that would take for you to do?..."

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CILL FRAMEWORK : PROMPTS FOR REFLECTIVE CONVERSATIONS

*NB This is not FOR students, but a template for TEACHERS to use and adapt for use with students at various levels, bearing in mind that the proactive coaching and design of the learning will determine students' ability to take responsibility for, and control of, all phases of the learning.

[handwritten circular diagram: CILL Framework wheel with labels including "STRUCTURAL KNOWLEDGE", "PLAN WORK", "OVERVIEW OF LEARNING", "KEY IDEAS KEY SEARCH TERMS KEY QUESTIONS", "FIND INFO & START SELECTING WHAT FITS WITH YOUR KEYS", "USE YOUR KEYS TO SCAN, SKIM AND BUILD IDEAS RELATED TO YOUR TOPIC QUESTIONS", numbered segments 1–8]

*Teachers of younger students use 'I' as 'we' to walk children through the process and articulate thoughts as an 'expert' guiding 'novices' and model, model, model.

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DESIGNING THE LEARNING CONTEXT

The narrative map of the CONTEXT dimensions of the CILL model on page 4 looks at all the things you will need to think about when you design and plan CILL learning.

The narrative map gives you a holistic overview of all the things that you, in your role as coach, need to think about in planning for the learning *before* you start and *during* the process.

To help you navigate the map, you need to think about these key components of the learning context:

1. **The learners** : ask yourself the following questions:
   - What are they like as learners?
   - What do I/they expect?
   - Have they done this sort of learning before?
   - Can I see how I might need to help them?
   - Could they help each other?

2. **The curriculum**
   - What do you have to get through curriculum demands?
   - Does the topic/ content really lend itself to this type of learning?
   - Have you got time? Constructivist information literacy learning needs TIME!

3. **The constraints**
   - Have you got TIME, RESOURCES, access to technology, technical help if needed?
   - Have YOU got the energy at this time of the term/ year?
   - Do learners have enough prior experience of this type of learning, or will they need a lot of pre-teaching? Will it be enough to teach the skills in context as the need arises, or does there have to be a lot of seeding and foundation-building to ensure that they will succeed in this type of learning?

4. **The knowledge**
   If you look at the various types of knowledge (subject/ strategic/ heuristic/ self-as-learner and construction knowledge) that learners need, you can anticipate where you need to coach, monitor, nurture, reassure... and it gives you an idea of how many proactive checkpoints you need to design into the process, and where...
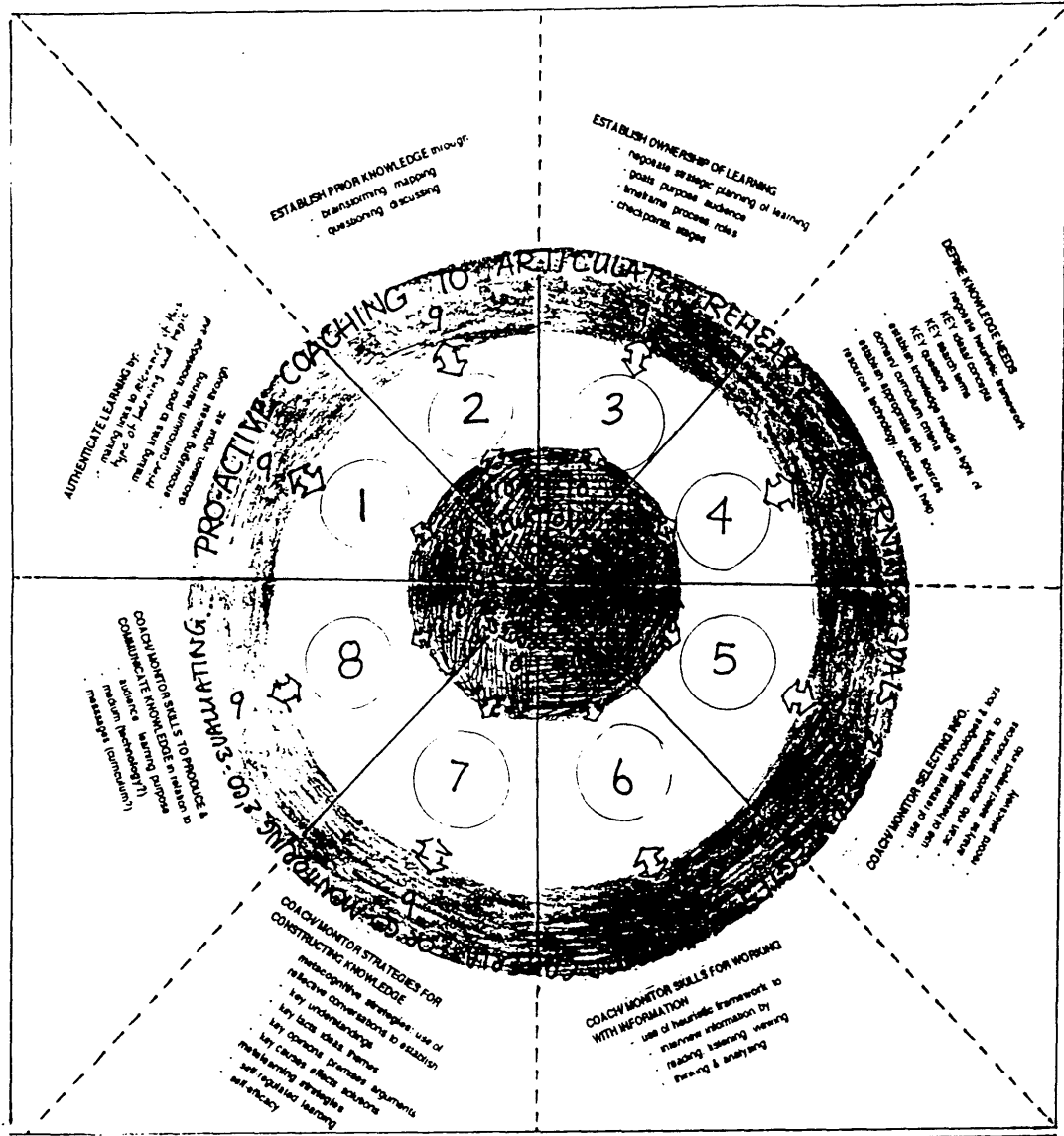
5. **Reflective conversations**
   When you design and plan the learning, you build in checkpoints for reflective conversations so that you know you are providing opportunities during the learning for them to:
   - talk about WHAT they are learning - the ideas, important understandings, their synthesis of what they have read, heard, seen, thought, discussed...
   - talk about HOW they are learning it - the processes, the skills for selecting, rejecting, synthesizing information, making notes, organising notes and ideas, etc, plus the self-management, time management and monitoring strategies they are using, how, when and where their confidence as learners is growing; where they need more practice.

> **CILL is about learning to learn. It is NOT about finding information. The teacher's best preparation is to think through these dimensions of knowledge in relation to knowledge of learners, knowledge of curriculum and constraints, ie design the whole learning context by thinking it through before you begin and throughout the process.**

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CILL FRAMEWORK

This is NOT a linear sequence. Any prop can be used independently. For example, Prop 8 could be used to coach essay writing or exam strategies. The important feature is that Props 9 and 10 underpin and run through all the others so teachers using the props to guide coaching use them as 9 + 1 + 10, 9 + 2 + 10, etc. This is NOT a framework for students. It is a framework which provides a menu from which teachers can identify and select aspects of information literacy learning that need to be planned, coached, monitored and evaluated.

Focus	1 2	3	4	5	6	7	8

		9 PRO·ACTIVE COACHING	10 CO·EVALUATING
	PLANNING : 9,1,2,3,4	• SELF-REGULATION – plan the learning	• PRODUCT/CONTENT : meet negotiated criteria ? To what extent ?
	COACHING : 5,6,7,8	• SELF-EFFICACY – articulate + demonstrate learning skills	• PROCESS , ability to self-regulate learning, monitor, etc
	REFLECTING : 10→9	• GOALS – purpose of topic and purpose of this type of learning	- self-efficacy - consciousness of skills + strategies
		• CRITERIA – negotiated criteria for product and process	• AFFECTIVE ; named sense of value - sense of achievement

WHY is Prop 1 a key dimension of CILL?
Students need to see themselves as learners
undertaking an authentic, personally
meaningful learning process. CILL provides
a process which they can learn to control.
Older students often think (but don't say)
the thoughts in Col 1. These thoughts may
underpin their attitude to the learning. As
coach you can focus their thinking with the
prompts in Col. 2 and strategies in Col. 3.

AUTHENTICATE LEARNING

- overview of this type of learning
- why useful/ valuable/ interesting
- making links to self-as-learner
- encouraging interest through discussion, input, etc
- learning-to-learn
- learning to manage learning

1

STUDENT THOUGHTS : EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
What exactly do I have to do when I do this sort of learning?

How do I know? Will you tell me/ show me/ give me examples?

What exactly do you want me to produce?

Wouldn't it just be easier if you gave me the information and I could learn it?

How do I know what to go and find out if I don't know anything about the topic?

You've told us to come and see you if we need help, but how do we know what we need help about?

How does this help me for the exam? So why don't you just tell us what we need to learn?

Why should I go and find out about X? You've given us a choice, but maybe we'll get Y in the exam, and I've gone and done X.

Why do we have to spend months researching a boring topic that doesn't fit into the curriculum? It isn't going to help us. I want to get the qualification, not do research. | How can I give them an overview of this kind of learning? What is it for? Why is it valuable? What is it like?

Why is it valuable for current later/ lifelong learning?

How is it shorthand for all learning

How would it help them to recognize their strengths and weaknesses and learners?

How is it different from what they've done before?

What are the drawbacks (ie, time consuming, not cut and dried)?

What are the advantages (ie, the opposite - freedom to explore, find out, choose what interests you)?

How can I do all this quickly and with enthusiasm so they are not bored or intimidated before we start?

Can I help to provide structure by translating a lot of the process into proformas and templates so that they can concentrate on the journey, rather than designing the routemap?

Have I, in my role as co-director of learning, teacher-as-coach, designed this routemap adequately? | Depending on age of students, a metaphor, eg detective looking for clues and piecing together information can be useful to give overview of process.

Depending on age of students, using the idea of planning a trip. If you want to get from A to B you map that area of country, plan time, resources and record (photos, journal, whatever) what happens along the way, do a show-'n-tell afterwards... lots of useful parallels.

Older students - set in context of workplace, ie these are the skills employers want to see demonstrated • keeping knowledge up to date • solving problems • finding appropriate information quickly • team work • producing concise, accurate reports

Older students - need to work more efficiently, get more out of time invested. CILL embraces all the most significant learning-to-learn skills. Helps students to self-diagnose areas of strength and weakness, and to save time by identifying and correcting unproductive work habits.

All ages - is there anything interesting, controversial, about this topic? How does it link to what has gone before/ what is to come? Why do YOU see it as important? Why do you think this is a good way to learn about it? Your ENTHUSIASM for the topic and this way of learning is a key strategy. |

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WHY is Prop 2 a key dimension of CILL? For
students of all ages inquiry/ project/ resource-based
learning often represents hunting for a few
disembodied facts to paste up (literally or
electronically) to answer' questions. Linking the topic
to prior knowledge, to prior curriculum work, to
interests, intrinsic learning needs, etc, sets the topic
in a personal and curricular context for the student,
and gives the learning purpose and authenticity.

ESTABLISH PRIOR KNOWLEDGE

- making links to current/ previous/future curriculum topics
- making links to prior knowledge
- making links to interests
- making links to curiosity/ need to know, to expand knowlege

2

STUDENT THOUGHTS : EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
How do I know what I know? I don't think I know anything! I'm here to be given knowledge?

How can I do this so fast? I need time to think.

How does this relate to what we have to cover for exams?

I can see from this brainstorm that we know quite a bit, but how does that help me to work out what to do next?

How do I work out 'gaps' in my knowledge?

Why should I map my knowledge?

How does a knowledge map help focus my questions?

How does it relate to the curriculum/syllabus content we have to cover?

This brainstorming, mapping, key terms, key ideas stuff takes ages. How does it help me to learn the content we have to learn?

What do I do next? | Have I chosen a topic where students already have some knowledge and can articulate it?

Is this a fact/information rich topic suitable for resource-based learning?

How can I get them to cream off their knowledge when they brainstorm, not just give word associations?

How can I stop them discussing the topic and (secondary) putting each other down?

How can I ensure that we cover what the curriculum/ syllabus says we have to cover?

Can I emphasise aspects of the topic related to the curriculum and make suggestions?

Brainstorming and mapping appeal to 'visual' learners. How can I support those who prefer learning to be a set of sequential tasks?

How can I make them see that structuring knowledge is a key strategy in finding more information/ communicating knowledge?

How can I tie these strategies back into the process so that they see them not as discrete tasks, but as key ways of working out
- what they know - what they need to know - knowledge gaps
- what they need to know to build more knowledge - expressed as questions

How can I model these ideas simply to children with emergent literacy skills?

How can I make them see that they need to build a foundation for their knowledge; that it's about knowledge building... not just finding answers to questions? | At all levels: BRAINSTORMING, especially if FAST and focussed in 3 min bursts to work in groups/ individually to articulate existing knowledge.

At all levels: Re-brainstorming elements emerging from original brainstorm that have curricular relevance can be expanded on, possibly after some input.

Junior levels: Pictorial brainstorming. Takes longer, but good if older students/ parents/aides are there to scribe captions.

At all levels: DISCUSSION, particularly with coach highlighting where aspects intersect with curriculum ie must be covered. Coach builds in curriculum links.

At all levels: MAPPING KNOWLEDGE into linear tree diagrams or spidergrams helps build overview of topic and provides structure for • developing questions • selecting information • notemaking • structuring presentation.

At all levels: DISCUSSING AND SHARING MAPS. Coach can ensure that curriculum requirements are covered, and introduce new sub-topics if necessary to ensure coverage.

Junior levels: PICTORIAL MAPS. Coach can demo by cutting out and sorting pictorial brainstorm pict`ures into categories and give simple labels.

At all levels: Some input can anchor brainstorming, mapping and discussions and leave students wanting to know more. |

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ESTABLISH KNOWLEDGE NEEDS...

WHY is Prop 4 a key dimension of CILL? This type of learning is often doomed from the start by the students' assumption that they are 'doing' a topic, ie finding out facts about it. Being told to devise question/s often produces either trivial or HUGE questions. The heuristic or Key Framework (KEY ideas, KEY search terms and KEY questions) links prior knowledge to intended curriculum outcomes and directs what they look for, and how they process it through their heads.

- negotiate heuristic framework - key concepts, terms, questions
- define knowledge needs in relation to curriculum objectives
- determine appropriate information sources, information technologies, sources of help

STUDENT THOUGHTS: EXAMPLES	PROMPTS: EXAMPLES	STRATEGIES: EXAMPLES
What exactly am I trying to find out - what topic and sub topic? - what are the key ideas, concepts, key curriculum requirements?	How do I get them to see that there's more to info sources than Encarta and the Internet?	At all levels students need help developing key search terms and realising that key (important) words are only good search terms if they are nouns, and in 'book language', ie the coach can model it by showing the terminology in contents pages and indexes.
What makes it interesting, valuable, worthwhile learning (key ideas)?	How do I get them to problematize their topic, eg to try to find out WHY this and that, not just look for random facts on a topic?	At all levels it helps if students can identify key ideas, key concepts, what's important about the topic BEFORE they develop questions. These key ideas, etc, should be articulated to answer the implicit question, 'So why is this topic important for us to know about?'
Have I gone back to my brainstorm and map and checked them against a [text]book on the topic (contents page, index) to check the right terminology for my key search terms?	If they are going to use people as information sources, do I need to lay the groundwork (especially for junior students)?	At all levels random questions never provide as much relevance and focus as questions developed in relation to topic categories, ie developing questions is a logical outcome of brainstorming existing knowledge and clustering it in categories or subtopics and then developing 'What do I want to find out' questions in relation to those categories.
Have I gone back to my map categories and thought 'What do I need to know? using the who what why where when and how prompts to form key questions related to each category?	How can I ensure that their search terms use appropriate subject vocabulary?	At all levels the W & H prompts (who what where when why and how) help prompt questions related to each of the categories.
Have I sorted these questions into - easy (factual) questions first, - harder (thinking or inferential) questions for later?	How can I ensure that they have search terms that are searchable, ie not 'key' words like 'Big'? Can I model it using the contents and index pages of a book? Can I make the assumption that they will transfer these skills to online catalogues or Encarta?	At all levels the coach needs to demonstrate how to prioritize questions into - factual (easy to search first)
Have I phrased these questions using some of my key terms?	How can I focus their questions so that they reflect the significance of the topic (and curriculum outcomes)?	- inferential, hard, global, thinking questions that focus questioning.
Have I seen myself in the role of an interviewer who knows the topic well enough to ask some pretty sharp and incisive questions? In otherwords, do I have enough background information to make it worthwhile interviewing the information? If I don't it's like going out to look for facts which will bounce around in a vacuum.	How can I get them to: - ask factual questions first to build a bed of information? - break down complex questions into simpler question sequences? How can I make sure they are equipped with questions, not statements, eg 'the moon is in the sky?' How can I focus on getting them to think about a range of appropriate resources, not just expect 'the' answer to leap out of the first source they happen on?	At junior levels the coach needs to model over and over how to turn statements into questions using the W prompts.

3

ESTABLISH OWNERSHIP...

WHY is Prop 3 a key dimension of CILL? For students of all ages Props 1 and 2 build interest in and commitment to the learning. Prop 3 consolidates this commitment as OWNERSHIP. Developing plans for a process, learning goals, deadlines and criteria helps to anchor the learning and make the process more real and relevant.

- negotiate goals, purpose, audience
- negotiate plans, deadlines
- negotiate stages, checkpoints, roles
- negotiate audience
- negotiate criteria for process and product

STUDENT THOUGHTS: EXAMPLES	PROMPTS: EXAMPLES	STRATEGIES: EXAMPLES
Why should I commit to this kind of learning? It's slow and tedious and there must be easier ways?	How can I get them to 'buy into' and take responsibility for the learning with commitment and enthusiasm?	At all levels, but for different reasons, many learners STILL have difficulty visualising what a learning process means in terms of what THEY will do. The coach needs to work with them through a negotiated planning process involving:
Is this like school projects?	How can I get beyond the 'just tell us what you want' frustration level?	goals (product and process) stages, checkpoints, deadlines, modus operandi - group, roles, shared/allocated responsibilities level of choice/criteria (for a good product and process)
How do I know exactly what you want if you haven't said what you want?	How can I get them to commit and STICK to a plan and not procrastinate in favour of more 'urgent' tasks?	
Why do we need to come and see you at the checkpoints?	How can I define what I see as a 'good product' and 'good process' without telling them what to do?	At all levels, for all these elements, there should be choice within structure, opportunities to coach and monitor, and for direct teaching of skills,
What exactly are we supposed to produce?	Can I help them to develop criteria for what they expect a good product and a good process to be in this instance?	opportunities for proactive coaching before each step so that students can articulate goals and skills, and can 'rehearse' and get help in advance, ie are 'set up for success'.
Do I have to do all of the steps and stages? I had to do a lot of this last year, and I don't work like this. It doesn't suit my learning style.	Can I articulate my expectations of their learning on paper?/What will they know as a result of doing this work?	
How long is this going to take? Do we have to do such a boring topic? I'd rather do something I'm interested in.	Will planning proformas and guidance sheets reduce my input and give THEM more responsibility /choice /control?	At all levels negotiated choice emphasises affective dimensions of learning - self efficacy and self regulation.
	Have I built in checkpoints for proactive coaching, ie how will I tell them what they need to think through BEFORE they go and do it?	Junior levels: Same applies but coach models and 'talks through' the whole process.
	Have I done everything in my power so that they WILL succeed in this type of learning, ie provided practical scaffolds, affective scaffolds, direct PROactive coaching of skills, criteria?	

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WHY is Prop 5 a key dimension of CILL? The challenge of going to a library and locating a book used to defeat many students, even undergraduates. Now, knowing where to go, and how to access information from a range of people, print and electronic technologies and sources using a bewildering number of different search techniques is truly daunting, even for confident learners and their teachers. It needs careful guidance by the coach, as does learning to sift and REJECT more information than you select.

COACH SELECTING OF INFO — 5

- use of information retrieval technologies
- use of heuristic framework (keys) to select information
- use scanning and skimming to reject and select info
- record info selectively
- organise it effectively

STUDENT THOUGHTS: EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
Where can I go? - what kind of information is best for my topic? -where is the best place to look for this kind of information? - how do I find it? - do I know how to use all the tools and technologies? - who can I ask for help? - do I know exactly what I'm looking for? - have I got my key questions and key search terms in front of me? - have I got my knowledge map with me so I can get an overview of where the information could fit in? - what do I look up? What search engines do I use? - what do I do? There's nothing on my topic? There's nothing on my topic!. I've looked everywhere. I've found some stuff. Do you want me to download it or write it out or what? I can't find any answers to my questions but some of this information looks important/ interesting. What am I supposed to do? How do you want me to do notemaking? What am I supposed to pick out? It all looks important.	How can I check out sources and resources for 30 students doing 30 different topics? *(Answer: You can't! 30 free choice topics is the freedom for students to fail, not succeed. DON'T allow it!)* How do I know what's available? *(Answer: Work with colleagues and a librarian and ASK, leaving plenty of time).* How do I know which search protocols to use, and how? *(Same answer: Ask and try)* How can I persuade them to use synonyms or a more/less precise term if they have to refine/ broaden a topic because they can't find info or find too much? Do I have to do it all for them? *(Answer: No, no, no! Just enough to get a feel for it and to get some starting points for them)* How can I ensure that they find enough, but not so much that they are overwhelmed? How do I focus them when they get similar information from different sources and can't seem to compare, summarise, synthesise? How do I stop them from getting hopelessly sidetracked or bogged down?	At all levels this is where thinking through (front end loading) the preparation helps. The coach needs to have a mental map of the information territory, ie a good idea of what CDs, books, journals, Dewey nos, Internet sites, descriptors and search terms are useful. It helps to have bookmarked some Internet sites as a starter, and even thought of/pre-contacted some possible 'experts' for phone/ audio-conference/ live/ email interviews. It saves time and sets students up to succeed in locating good sources and finding good information if you can give them suggestions and starting points. At all levels information can overwhelm. ALL students need the coach to model the process by talking aloud how they KEYS (key terms, ideas, questions) are used as a filter to scan and skim material and reject and select, ie strip out only what is relevant to the key questions, key ideas, looking for key search terms like radar signals. At all levels determining what is relevant and how to select and reject information needs to be taught, modelled and articulated. At all levels coaching includes demonstrating how you decide what to record/ write down, and how you summarise key points and record bibliographic details.

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WHY is Prop 6 a key dimension of CILL? If students are going to turn the information they find into their own knowledge, they need to work with it, process it through their heads. Interviewing and analysing the information is the key to constructing knowledge. It requires skills that are often assumed by teachers. Students of all ages need to be coached to actively interview and analyse information.

COACH WORKING WITH INFO — 6

- Interview information using reading, listening, viewing, thinking skills and graphic devices to analyse the info

STUDENT THOUGHTS: EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
What do I do with it when I find it? What does this information tell me about my topic? How do I use scanning and skimming with my key terms to select information? What happens if I get a whole lot of information, and it all says much the same? How do I compare information and summarize it? Can I visualize how information is filtered through my key terms, key ideas, key questions and into my mind so that I can think about it and work with it in my mind? Whether my 'text' is a book, Encarta, the Internet or a person, can I 'see' myself actively interviewing this information source, using my questions flexibly? When I 'interview' text can I see myself like an interviewer, phrasing my questions another way, really looking and listening for clues, really trying to get to the information?	What can I do to ensure that they filter the information through their heads, not just copy, photocopy or download chunks of it? How can I teach them to select and extract information from the text, looking for information related to their questions, not ready made answers? How can I get them to realize that you compare, collate and BUILD information and think about it before you get 'answers'? They know about scanning and skimming but few seem to do it. They seem to think that if they read everything slowly and carefully they'll do better. How can I persuade them that using key search terms to scan and skim text saves a lot of time? Have I taught them how to use strategies like making lists of pros and cons, like using Venn diagrams to compare and contrast pieces of information from different sources, like using a circle to state and argument and then lines to indicate supporting evidence? Have I taught them to reference their material accurately, acknowledging author, title, date? Do they understand that downloading from the Web without processing it through their heads is plagiarism?	At ALL ages students need to be coached to work with the information they select, using their key questions to 'interview' the information. This is an active, interrogative process of looking for clues. At junior levels this needs to be modelled and practised using simple strategies like putting questions on the board, reading/ showing a video and asking children to put hands up when anything relates to a question. Even older students need to be disabused of the notion that they are looking for AN answer to A question which will pop out shrink wrapped from text. They need a coach to model and get them to practise collating, relating and summarising information from different texts and BUILDING it into knowledge by thinking about it, analysing it, discussing it, processing it through their heads. Even older students need to be reminded that there's no virtue or value in reading text slowly and deeply from a - b unless they are studying to remember it. You need to model the use of key search terms for skimming and scanning to select passages for 'deep' reading/ viewing. They need the coach to talk aloud how a quick look confirms whether this bit relates to the key ideas/ questions and should be thought about and analysed more deeply.

COACH CONSTRUCTING KNOWLEDGE

7

- metacognitive strategies
  - use of reflective conversations to establish key understandings, key facts, ideas, themes concepts, key opinions, premises, arguments, key causes, effects, solutions

STUDENT THOUGHTS : EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
What do I DO with all this stuff; I don't even know what half of it means? What do you want us to do when you say 'sit in your group and discuss it'. Discuss what?	How can I get them to see that the purpose is not collecting information, but organising it, on paper and in their theads, so that it can be analysed and synthesised?	The coach needs to think ahead how opportunities can be built into the learning for 'reflective conversations' eg - informal with coach - with whole class - with peers- with self, eg diary, log, journal- with expert mentors.
Look, I've got fantastic stuff - I've got x pages from Encarta, x from the Internet, Mum copied a whole lot of stuff from the library - I've got a whole box of stuff. What do I do next?	How can I get them to THINK about the info, operate on it with their minds using their key questions and key ideas as a focus?	These conversations need to include coaching, demos and modelling of the skills needed to:
Hey, I've read this stuff once. You don't want me to read it AGAIN do you? Why?	How can I get them to articulate the knowledge building process in their heads - not just what they do, but their thinking, ie 'metacogggging'and metalearning?	- ANALYSE INFO eg into key points, key ideas, key principles, confirm/disconfirm hypotheses, find evidence to support arguments, etc.
Yes, I got some stuff, but it's not very good.	How can I get them to see that their map categories are the basis for a card, folder, database or box sorting and filing system, and that they can code and use their map search terms as descriptors?	- SYNTHESISE INFO eg by looking at info from different sources, summarising in own words.
What do you mean think about it? What do you want me to think about? What do you mean by 'What are my opinions?' I don't know. I don't really have any. I don't really think much about this sort of stuff. It's not important to me.	How can I get them to see that coding their notes takes time but saves a lot of time spent searching and re-reading because writing becomes a matter of joining the numbers and editing?	-INTERPRET INFO eg by applying the SO test, So what? So what's important? So what's it really mean?
Ah, OK, you want me to make points related to each category and the questions I got from each category? That's easy.	How can I get them to see how info from different sources can say similar things? Could I model it using Venn diagrams for the 'visual', questioning for the 'verbal' and concept maps for the 'abstract'?	- CREATE INFO by articulating own understanding, ideas, opinions. - ORGANISE INFO eg sorting into folders, files, database, cards using map categories as labels or descriptors.
So what I know is really a summary of what I understand from all the stuff I've read and seen?	Could I use: graphics,tables, powerpoint, charts, to encourage them to strip out and summarise key points?	At ALL ages provide metaphors, like the builder building knowledge, like gutting and stripping to get to the gist, like seeing an argument as a spine, all the supporting evidence as ribs.
Are you saying that it isn't knowledge until you've really thought about it, talked yourself through it in some way?		

COACH COMMUNICATING KNOWLEDGE

8

translating knowledge into clear messages related to learning purpose, assessment requirements, audience, medium and technology

STUDENT THOUGHTS : EXAMPLES	PROMPTS : EXAMPLES	STRATEGIES : EXAMPLES
I'm just no good at writing. I know I probably know it, but I just can't say it.How can I tell you what I know? I've found out SO much. We've done heaps of discussing and stuff, but I don't know where to start?	How can I help them to get over the 'I know it; just can't express it' paralysis? How can I get them to see that producing and communicating their know ledge is about communicating content in the right medium for the audience, using the right strategies?	The coach needs to work with students to see that, however much they know, in formal education it needs to work for them. They need to focus on STRUCTURE irrespective of medium of presentation.
OK, so if I use my key categories and key questions and key search terms, will I have a structure to frame the presentation of my knowledge?	Can I link this to all the English work on genre and modes?	1. COMMUNICATION identifying. - the audience - expectations- expertisetbe modium/media - technology-written/visual - dramatic, etc.
How can I do a multimedia presentation? I really want to do it cos it's neat.	Can I draw simple graphics to show, for example, how the map forms the body, and introduction the head, and conclusion summarises the key points and understandings at the end?	2. SKILLS needed to use these media well. 3. HELP needed to use these media well
We're doing a presentation for Year 3s and they don't know very much so I'm not going to prepare anything. I know enough.	Can I show them how to design simple structures for presentation, and use simple triggers like palmcards for talks, etc?	4.The content/ knowlege MESSAGES - clear, concise, unambiguous - effective - gets meaning across - relevant to curriculum topic and learning purpose.
I couldn't think of anything, so I just wrote whatever came into my head.		Front end loading the planning by developing proformas and graphics and charts to focus Props 1 - 5 help learners to structure and clarify, even just as a focus for discussion with coach and peers.
Oh, just hand it in like it is. It looks OK and she doesn't care as long as it looks OK.		At all levels, tried and true strategies like Head, Body and Tail for presentations, essays, etc;' say what you are going to say, say it and then tell us you have said it' sound trite, but help students to focus and simplify.
I've done the border and all my headings on the computer. It took ages. You can do the rest.		

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APPENDIX 5

Q.S.R. NUD*IST Power version, revision 4.0.
Licensee: Gwen Gawith.

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(3 7 3 1)	/PROPS/CONSTRUCT/SYNTHESIS/SUMMARIZE
(3 7 3 1 1)	/PROPS/CONSTRUCT/SYNTHESIS/SUMMARIZE/DIFFMEDIA
(3 7 3 2)	/PROPS/CONSTRUCT/SYNTHESIS/COLLATE
(3 7 4)	/PROPS/CONSTRUCT/INTERP
(3 7 4 1)	/PROPS/CONSTRUCT/INTERP/INFERENCES
(3 7 4 2)	/PROPS/CONSTRUCT/INTERP/OPINIONS
(3 7 5)	/PROPS/CONSTRUCT/ARTIC
(3 7 6)	/PROPS/CONSTRUCT/STRUCTURE
(3 7 6 1)	/PROPS/CONSTRUCT/STRUCTURE/SELF TALK
(3 8)	/PROPS/PRODUCE
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(3 8 1 1)	/PROPS/PRODUCE/AUDIENCE/PURPOSE
(3 8 1 2)	/PROPS/PRODUCE/AUDIENCE/ASSCRIT
(3 8 2)	/PROPS/PRODUCE/MEDIUM
(3 8 2 1)	/PROPS/PRODUCE/MEDIUM/PROJECT
(3 8 2 1 1)	/PROPS/PRODUCE/MEDIUM/PROJECT/CHART
(3 8 2 2)	/PROPS/PRODUCE/MEDIUM/TECHNOL
(3 8 2 2 1)	/PROPS/PRODUCE/MEDIUM/TECHNOL/MULTIMEDIA
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(3 8 2 4 3)	/PROPS/PRODUCE/MEDIUM/PROBS/COGASSIST
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(3 8 3 2 1)	/PROPS/PRODUCE/MESSAGE/CLEAR/RELQS
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(3 8 3 4)	/PROPS/PRODUCE/MESSAGE/PROBS
(3 8 3 4 1)	/PROPS/PRODUCE/MESSAGE/PROBS/NOARTIC
(3 8 4)	/PROPS/PRODUCE/COMMUNICATION
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(3 8 4 2)	/PROPS/PRODUCE/COMMUNICATION/CLEAR
(3 8 4 3)	/PROPS/PRODUCE/COMMUNICATION/EFFECTIVE
(3 8 4 4)	/PROPS/PRODUCE/COMMUNICATION/PROBS
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(3 9 1 2)	/PROPS/EVAL/ASSMENT/PROCESS
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(3 10 5)	/PROPS/STUDENT/LOW ABIL
(3 10 6)	/PROPS/STUDENT/ADOLESCENT
(3 11)	/PROPS/RESEARCHER
(3 12)	/PROPS/TEACHER

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(3 12 2)        /PROPS/TEACHER/changes
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(4 1)           /FRAMEWORK/USE
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(4 1 1 1)       /FRAMEWORK/USE/TEACHERS/PLANNING
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(4 1 2)         /FRAMEWORK/USE/STUDENTS
(4 2)           /FRAMEWORK/CHANGES
(4 2 1)         /FRAMEWORK/CHANGES/STRATS
(4 3)           /FRAMEWORK/PROCESS
(4 3 1)         /FRAMEWORK/PROCESS/BENEFITS
(4 4)           /FRAMEWORK/PROGRESS
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APPENDIX 6

Semi-structured phone interview on use of CILL Framework

Please read these questions and think about them, but don't feel that you have to write anything down or answer them in depth. It is just intended to provide a catalyst and focus for our conversation.

Overall how are you using the CILL Framework? For example are you finding it useful:

1. To focus your **planning** and preparation? Can you give an example?

2. To **observe, monitor** and **reflect** on student learning? For example?

3. To focus how you **guide/ coach** student learning. Are you doing more direct teaching of skills? How? Please could you think of examples of how the framework might have influenced this aspect of your teaching?

4. To use it **diagnostically**, showing you where you need to:
    - plan more/ differently? For eg?
    - monitor more/ differently? For eg?
    - teach more/ differently? For eg?
    - manage the learning differently? For eg

5. To use it **generally** to highlight your awareness of this type of learning:
    - demand on teachers? For eg?
    - constraints? For eg?
    - demands on students? For eg?

Specifically how are you using the focus strategies and the props:

6. **Co-directed learning** and **proactive coaching:**
    - do you find you can integrate co-directed learning and proactive coaching into your teaching? For eg? How, when, where?
    - do you find that students understand what you are trying to do?
    - is it helping them to learn to control their own learning?
    - can students articulate WHAT they are going to do, HOW and WHY?
    - can students work with you to articulate PROCESS and PRODUCT criteria?
    - do you feel comfortable with this idea of co-directed learning and proactive coaching? Will you go on using it? If not, why not?

7. Front end loading the **learning design** (planning for *learning*):
    - are you doing it? How? (mentally or using diagrams, etc?) How long does it take?
    - do you do it consciously and just think about in between other things or just keep in the back of your mind?
    - do you feel comfortable with the idea of designing learning rather than planning teaching sessions? Is it something you will continue to use? Any comments?

8. The **props:** given that they stand for propositions, ie proposing that these ten 'things' are integral to, an essential part of constructivist information literacy learning, do you see them as realistic and achievable (to a degree) even within the current constraints we have identified eg time, student expectations of learning, student skill levels, big classes, mixed ability classes, content converge, resources, etc?

Could you also comment on how you see/ are using each of the props:

Teachers need to:

1. Help learners to authenticate learning

2. Help learners to establish prior knowledge

3. Help learners to establish ownership of learning

4. Help learners to define knowledge needs

5. Coach selecting of information

6. Coach skills for working with information

7. Coach strategies for constructing knowledge

8. Coach strategies for producing and communicating knowledge

9. Coach each prop proactively (integrating prop 9)

10. Evaluate each prop formatively and collaboratively (integrating prop 10)

9. What do you see as the main **constraints** for you, personally, in this constructivist approach to information literacy learning?

10. **Overall :** perceived benefits to your **teaching?**

   Overall : perceived benefits to student **learning?**

And many thanks for your help!