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**ENGAGING WITH KEY GRAPHICS: A JOURNEY
FROM STUDENT USE TO STUDENT CONSTRUCTION**

by

BARBARA M. BROCKMANN, B.A., B.Ed.

A thesis submitted to
the Faculty of Graduate Studies and Research
in partial fulfilment of
the requirements for the degree of

Master of Arts

Department of Linguistics and Applied Language Studies

Carleton University

Ottawa, Ontario

May 31, 1996

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"Engaging with Key Graphics: A Journey from Student Use to Student Construction"

submitted by Barbara Brockmann

in partial fulfilment of the requirements for

the degree of Master of Arts

Thesis Supervisor

Graduate Studies Supervisor
Department of Linguistics and Applied Language Studies

Carleton University
31 May 1996

ABSTRACT

Among the educational challenges facing students and teachers at inner-city schools in the 1990's are the following: how to teach where diversity is the norm, how to learn despite the complicated demands of the task, the text, and the teaching style; and how to advance equitable educational outcomes.

The topic of this thesis is one response to the challenge of meeting these needs. It is based on the Knowledge Framework (Mohan, 1986), a multi-dimensional tool that co-ordinates the learning and teaching of content, thinking, and language through the use of key graphics. It extends that work by documenting *this* teacher's path of engaging students in the use of key graphics with the goal that they be able to identify, construct, and use them for their own learning ends. As well, the conditions which made the journey possible are explored through the lens of genre acquisition. This thesis ends with an examination of the unexpected treasures of the journey: what the use of key visuals and the Knowledge Framework did for us as participant-researchers in our roles as student and/or teacher, and, finally, what the research process--the undertaking of the journey--did for us as learners and educational collaborators.

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- * Bernard Mohan for developing the Knowledge Framework which has provided educators with a brilliant tool to assist them in meeting the complicated demands of teaching today
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- * My Advisor, Professor Stan Jones, whose support and enthusiasm was unflagging from the beginning, and whose timely questions and insights always helped me to take a step further or see a shade deeper.
- * My family and friends who took an interest and encouraged me even when they were not quite sure what this was all about.
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THE CHALLENGE

A major challenge facing teachers today is to effectively address the knowledge and the language needs of students of diverse backgrounds whose different learning styles and academic strengths are part of multi-ability classes in the Transitions Years. Strategies must be developed and used which will make it possible for first and second language learners to access content from oral and written texts and to reconstruct their knowledge in different modes of communication. These strategies should be flexible and multi-dimensional enough to accommodate the needs of various types of learners, while being comfortable enough for teachers to use simultaneously within a regular period of instruction without requiring excessive preparation time.

A significant challenge for students in the Intermediate Transitions years (Grades 7 - 9) is to learn critical content that will provide the knowledge and skills necessary to help them understand their world and assume their rightful place as citizens in our society. One of the difficulties students face in understanding content occurs at the transition from learning to read to reading to learn (Morris & Stewart-Dore, 1984). This transition is complicated by texts which are written in a more complex writing style, often containing technical or specialized vocabulary that isn't repeated. As content becomes more complex, syntactical ability to reproduce that knowledge in genres specific to certain fields of knowledge is also demanded. As well, teachers at higher levels of education tend to focus more on the subject content of their courses rather than on the methods best suited to transmit knowledge. This means

that visual and kinaesthetic learners are often left to fend for themselves in situations where content is communicated primarily in an oral fashion. Generally, secondary school teachers assume that students know how to learn and thus provide less support in this area. Knowing how to learn can be a factor that separates those who are successful in school from those who are not, regardless of a student's cognitive ability.

These challenges for teachers and students are set within the wider socio-economic context of whether, for whom, and in what circumstances education facilitates access to knowledge and power. Cummins (1981), in his work within the field of second language learning, made the distinction between two types of language use--Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency. The former, known as 'BICS', refers to the type of language use that is context embedded, concrete, and social; the latter, known as 'CALP', delineates the type of language used to communicate on topics that are abstract, context removed and academic. Cummins made this distinction in regard to the length of time it took English as a Second Language learners to reach native speaker levels in the different competencies. However, the distinction itself holds relevance for all language learners and language teachers. It is a way of recognizing which type of language use will facilitate success at school, without which the achievements of everyday literacy, employment, economic status, and the possibility of power are less likely to be realized.

Lisa Delpit's work (1988) is also concerned with what she terms the "culture of

power" and the failure of many educators to provide Black and poor students with the rules necessary to access it. This occurs because the good intentions of many "progressive" educators, who are involved in the debate over skills-oriented versus process-oriented approaches to education fail to take into account that while they already have knowledge of the rules, their culturally and economically diverse students' may not. In the end result, to "act as if power does not exist is to ensure that the power status quo remains the same" (1988, p 496). As Delpit sees it, many liberal, middle-class educators believe that the chief goal of education is for children to develop fully who they are without outside standards being imposed upon them. That may be suitable for students who already know the rules and codes for participating in power--who have the 'cultural capital' (Apple, 1979) to use

But parents who don't function within that culture of power want something else. It's not that they disagree with the former aim, it's just that they want something more. They want to ensure that the school provides their children with discourse patterns, interactional styles, and spoken and written language codes that will allow them success in the larger society (Delpit 1988, p 489)

Cognitive Academic Language Proficiency can be considered one of those social norms in our society that is a necessary prerequisite for success both in school and in society at large. In a sense then, educating students with diverse cultural and economic backgrounds involves a moral obligation to enhance their educational experience in such a way as to foster the development of content understanding and academic language use, thereby striving for equitable educational outcomes

In summary, these are the educational challenges which both my students and I face at an inner-city school in the 1990's. how to teach where diversity is the norm,

how to learn despite the complicated demands of the task, the text, and the teaching style, and how to do it with an eye to advancing equitable educational outcomes.

This thesis is a response to the challenge of meeting these needs. It is based on the Knowledge Framework (Mohan, 1986), a multi-dimensional tool that co-ordinates the learning and teaching of content, thinking and language, by using graphic organizers. It will extend that work by documenting *this* teacher's path of engaging students in the use of graphic organizers with the set goal that they be able to identify, construct, and use them for their own learning ends. Some secondary aspects to be discussed include the strategies that were developed as part of engaging students with graphic organizers, an examination of the conditions which made this specific journey possible, and some general observations on the outcomes for both the students and myself as a teacher

CHAPTER ONE

THE CONTEXT OF THE JOURNEY

LITERATURE REVIEW RELATED TO THE CHALLENGE

Today's teaching and learning challenge is really part of an age old quest to find better ways of helping students understand, remember and reproduce the knowledge they have gained in the classroom. While this challenge is complicated by factors such as the stresses of modern life and conflicting societal demands made on education, the directions suggested by learning theories, and the observations made through research can point the way to strategies which will facilitate more effective learning.

Graphics

The use of graphics as an aid to student learning is one strategy that has been developed in response to learning theories and is supported by research. Educators saw that graphic aids could help learners connect new information to background knowledge, which is the main precept of both Ausubel's (1968) learning theory and schema theory. Both theories are concerned with the connection between new knowledge and known concepts. Ausubel maintains that meaningful learning doesn't occur unless learners make a conscious bridge between the known and the new. On a similar note, schema theory sees comprehension as a process that is a result of the

interaction between the text (or new information) and the prior background content or schema knowledge of the learner (Carrell, 1982). The Gestalt theory of perception has also encouraged the use of graphics for other reasons: it holds that learners need to see the whole picture rather than discrete parts and that graphics are ideal for simultaneously presenting the whole and the parts. This theory has spawned the use of graphics for making content more "intellectually manageable" (Holliday, 1975, p.21). Additionally, Paivio's dual code model (1971) has also raised the interest of educators in graphics as a form of visual communication.

It seems that the use of graphics to activate, retrieve, or integrate background information with new content has developed as a response to meet these particular conditions for learning. Research results, whether they call the visual a graphic organizer (Boothby and Alvermann, 1984; Hawk, 1986; Herber, 1978; Vacca, 1981), a structured overview (Barron, 1979), mapping (Armbruster & Anderson, 1984; Hanf, 1971), networking (Dansereau, 1979) or map construction (Berkowitz, 1986), suggest that they *do* effectively assist learners in these tasks. For example, one way of activating schema knowledge has been to familiarize students with expository text structures that have been graphically visualized. This has proven to be an effective means of increasing reading comprehension for students in Grades Five (Armbruster, Anderson & Ostertag, 1987), Seven (Taylor & Beach, 1984), Nine (Bartlett, 1979) as well as for adult students in academic ESL programs (Carrell, Pharis & Liberto, 1989).

Additionally, graphics assist in assimilating both language and content in follow-up activities. Hawk suggests that the graphic does this because it "...provides a

framework that in turn provides reference points to aid the learner in assimilating the new vocabulary and organizing the main concepts into a logical pattern" (Hawk, 1986, p.86). He focuses here on the ability of graphics to provide a roadmap of the content in order to facilitate language use and boost comprehension

Hawk goes on to note how graphic organizers "...direct students to look for cause and effect, and comparison and contrast, for sequence of events, and a variety of other relationships" (p.86). He is, in fact, highlighting how graphics visualize the thinking which underlies content. Other educators, such as Clarke, esteem graphics for this very feature and emphasize it in their educational practice. "Visual organizers reflect patterns of thinking about content knowledge; they allow teachers to focus student attention on higher order thinking skills without shifting attention from subject area content"(Clarke,1991, p.526).

An increasing reality for the present generation of students is that the mass media is relying more and more upon graphic communication. Graphics such as description charts, flow charts, sequence charts and diagrams can be found more frequently in computers and print media from journals, newspapers, magazines, manuals to daily instructions like laundry directions: they are becoming part of everyday literacy activities, and the current generation of students will have to know how to read them.

At the same time, information concerning the effectiveness of graphics as a teaching/learning tool has not been widely disseminated within the teaching profession. Comments made to me by teachers during professional development seminars and

workshops demonstrate that although teachers may use graphics in a more or less haphazard way, they often lack a framework to help them identify how the use of graphics has assisted in the learning and teaching dynamic. By failing to articulate this, there is the chance they may not have realized the role that the graphic has played and be disinclined to use it systematically in the future. Thus, the positive and systematic use of graphics as suggested by research is only partially realized. A further illustration of this can be seen in a recent publication by the Ontario Secondary School Teachers Federation entitled Grassroots: A Practical Guide to the Transitions Years (Fried, Shallhorn & Shaw, 1992). It contains many useful chapters on research and pedagogy and uses a wide array of graphic organizers to support the written text. Although the use of graphics is utilized as an explicit means of making knowledge more accessible to the reader/teacher, the book fails to promote or even mention graphic organizers in the context of proposed teaching strategies to be employed in the classroom.

Despite examples of this kind of remarkable oversight, reports on the effectiveness of graphic organizers in assisting comprehension and the retention of text information have grown over the past fifteen years (Willows & Houghton, 1987). There is a heightened awareness of graphics, shown not only by the extent of research on types and functions of organizers, but by studies in ancillary areas such as the history of illustrations in textbooks (Mulcahy & Samuels, 1987), or the analyses of illustrations in textbooks (Evans, Watson & Willows, 1987; Hunter, Crismore & Pearson, 1987).

In reviewing the research that supports the use of graphics, one feature which stands out is the flexibility inherent in any particular visual Graphic uses have been researched at all levels of institutional education from the primary years to adult education. The actual functions researched are also broadly based--depending upon the purpose of the task and the focus of the researcher or educator. The studies cited here focus on using graphics at all stages of the learning continuum--pre-learning, during learning, and after learning, with the emphasis on assisting content comprehension. Some researchers have, in addition, linked graphics to other educational concerns. Clarke (1991), for example, demonstrates how graphics help to illustrate, clarify and develop thinking skills. Others employ graphics to specifically develop language use at the schematic level of text structure (Taylor & Beach, 1984), at the vocabulary level (Heimlich & Pittelman, 1986), and to enhance reading and writing skills (Miller and George, 1992). While these are all effective uses, they remain individually articulated. it is like adding several more singular juggling balls to a teacher's already precariously balanced repertoire of skills to develop and strategies to use.

However, what was lacking in educational pedagogy was a methodology which organized the graphic organizers and demonstrated linkages between graphics and their proven usefulness in developing thinking skills, facilitating content comprehension and assisting language use. This need was met when Bernard Mohan created the Knowledge Framework.

Bernard Mohan and the Knowledge Framework

Concerned with the need to integrate the teaching of language and content to facilitate Cognitive Academic Language Proficiency, and the need to avoid the failures to achieve academic potential seen in submersion situations (Cummins, 1979), Bernard Mohan of the University of British Columbia developed the Knowledge Framework. While this framework has proven to be applicable in any educational context or for any type of learner, it was originally developed with second language learners in mind.

The Knowledge Framework is a theoretical framework which articulates the links between the knowledge structures which underlie content, and the thinking skills, discourse structures and graphic representations used to express those knowledge structures in any situation. In practical terms, this framework is a brilliant multidimensional tool that can help teachers to understand, plan for, and execute both language and content lessons more effectively.

Graphics are the 'glue' of the framework. The visual shape unmask the structure of knowledge behind the individual facts as well as the thinking skills engaged in, thereby demonstrating the relationship between ideas. It highlights specific content words or phrases while the shape of the organizer replaces the verbiage that sometimes impedes understanding, thereby lowering the language barrier. Graphics, as previously noted in this literature review, can be used both as a scaffold and a springboard to understanding, remembering, and reproducing knowledge.

Mohan based his organizing framework on the concept of an 'activity'. In educational parlance, an activity usually means something students do in reference to

their learning. Mohan, however, defined an activity as arising within a socio-cultural context where, historically, a community educates its citizens into those activities which are considered publicly worthwhile. An activity, therefore, can refer to any situation in which we are involved. However, while the Knowledge Framework organizes 'activities' for educational purposes, 'activities' are more broadly based than that. Mohan quotes Dearden:

...a human activity is not just, nor indeed necessarily, a movement of the body... All human activities, even the most grossly physical, are necessarily mental activities... activities necessarily involve consciousness of one's situation apprehended under some description... The meaning of what people do, the correct description of their activities, becomes more and more transparent to us as we come to understand a form of social life...and the concepts developed by its communities of theoretical inquirers." (Dearden, 1968:132-134)

In Mohan's view, an activity combines both a practical and a theoretical aspect. The practical aspect allows you to apply what-you-know in what he terms an 'action situation'. At the same time, the theoretical aspect ensures that you have the required 'background knowledge' to understand what you are doing so that you can transfer what you know to other situations. These two aspects--of an 'action situation' and 'background knowledge'--provide one of the classification features of the Knowledge Framework, which Mohan visually organized into a '2 x 3' matrix.

The second feature of the matrix involves a classification of the structures of knowledge into six broad groupings. Mohan uses the example of a chess game to illustrate the groupings of the Knowledge Framework (see Figure 1.1). The action situation--playing a specific game in the here and now--involves observing or describing the chess pieces (description), sequencing their moves (sequence), and

choosing between moves for the most favourable outcome (choice) The background or theoretical knowledge required to participate in the present moment involves being able to classify the chess pieces (classification), knowing the rules for the move of each piece (principles and rules), and being able to evaluate the moves as most appropriate for the moment (evaluation) In a teaching/learning situation, both aspects are critical to be able to engage fully in the activity at hand

Figure 1.1 ACTIVITY CHESS (Mohan, 1986, p 43)

	Action Situation (Practical)	Background Knowledge (Theoretical)	
Description	identify chess pieces	classify chess pieces	Classification
Sequence	sequence moves	understand the rules for moves	Principles
Choice	choose appropriate moves	evaluate moves according to strategies	Evaluation

The six major knowledge structures of an activity or topic can be ascertained through the types of questions teachers usually ask when either analyzing topic material or planning a task. (See Figure 1.2)

The structure of the knowledge required for action situations (description, sequence, and choice), and for background knowledge (classification, principles and

evaluation) are common to all activities. Using the knowledge structure of classification as an example, children classify blocks in their play, gardeners classify plants, students classify elements in chemistry, while business people classify types of stocks and bonds for investment purposes. Although the structure of the knowledge remains the same, it is the subject and sophistication of the content being classified that changes.

Figure 1.2: EXPLORING KNOWLEDGE STRUCTURES WITHIN THE KNOWLEDGE FRAMEWORK Typical Teacher Questions

CLASSIFICATION	PRINCIPLES	EVALUATION
<ul style="list-style-type: none"> • What is a _____? • What features make this group a _____? • How are _____ and _____ related? • How many types/groups/kinds are there? • What are/are not examples of it? 	<ul style="list-style-type: none"> • How did _____ affect _____? • What is the result? • What is the cause? • What factors caused _____? • How does it work? • What usually happens next? • What are the solutions to the problem? 	<ul style="list-style-type: none"> • What are the reasons? • Evaluate the following.... • What are the pro's and con's? • Rate the following.... • What would be the best/worst? • What good and bad things could happen? • List possible consequences
<ul style="list-style-type: none"> • What does it look/smell/taste/feel/sound like? • Where is it located? • What are the differences/similarities between a _____ and a _____? • Compare _____ and _____. • Label the parts 	<ul style="list-style-type: none"> • How did it begin? • Describe the steps or stages. • Show the progression of _____. • What is the cycle? • What is the outcome? 	<ul style="list-style-type: none"> • What is your opinion? • What do you think is best? • What are the reasons for your choice? • Decide on the best course of action. • Make a decision/choice.
DESCRIPTION	SEQUENCE	CHOICE

In presenting his knowledge structure classifications, Mohan clearly indicates he does not consider this a finite grouping

The framework is not offered as a final and complete pattern, but can be expanded upon by adding other structures of knowledge. It is a focus for discussion and action by people working on the problem of relating language and content, to be expanded and modified as experience dictates (Mohan, 1986:40)

However, in an examination of Kindergarten to Grade 11 curricula, resource guides, and text books used by the British Columbia Ministry of Education, Early, Thew and Wakefield (1986) discovered that these structures did occur, and were evident in the language of the texts, tasks and tests, as well as thinking skills to be developed, and as curriculum objectives to be met. They discovered that these knowledge structures fit easily into the boxes of the Knowledge Framework.

Components of the Knowledge Framework

Mohan observed that each of these knowledge structures is manifested in thought by specific thinking skills, is communicated in language with specific linguistic features, and can be communicated visually through graphics (See Figure 1.3)

This is the juncture where the observations and facilitative functions suggested by previous research findings on graphics are consolidated into a manageable, comprehensive framework. Each aspect of the Knowledge Framework plays a role in fostering more effective teaching and learning of content and language. Therefore, not only can the Knowledge Framework organize content according to the knowledge

Figure 1.3: COMPONENTS OF THE KNOWLEDGE FRAMEWORK

structure that underlies it, it also highlights the thinking skill used, the discourse structures that communicate it, and the key graphic that visually represents it (See Figure 1.4) The linking of the three aspects is what makes the Knowledge Framework a brilliant and flexible tool. Clarification of each aspect follows.

While thinking skills and knowledge structures are undoubtedly linked, Mohan makes an important distinction between them. Knowledge structures are the organization behind the content or activity while the associated thinking process is the act of engaging with that organization. To coin a metaphor, if the knowledge structures are nouns, the thinking skills are verbs. Making learners aware of the knowledge structure behind the thinking skills can help them transfer these skills across content.

Figure 1.4: THE KNOWLEDGE FRAMEWORK A YEAR-LONG OVERVIEW

Key Visuals, Thinking and Language Use in our Classroom! 92/93 - B. Brockmann		
THINKING SKILLS	KEY VISUALS	LANGUAGE FOCUS: Language that can be transferred to all subjects (and life!)
Classification categorizing classifying defining developing concepts generalizing	Example #1: Example #2: Example #3:	- Language that groups or defines - "kinds of" - "types of" - is made up of (elements/parts/dimensions) - "generally"
Description comparing/contrasting describing identifying labelling locating measuring observing		Language that describes, measures or compares - "Similar to/different than/almost the same" - longer/shorter/taller/older, etc. - adjectives, adverbs - "while ... as ... as ... as ..." - "on the other hand"
Principles causal effect explaining, predicting inferring hypothesizing means/ends rules/strategies problem/solution	tables	Language that explains or predicts the how and why of things - "is caused by" "Consequently" - "results in" "As a result of" - "is due to" - "if ... then" - "when ... then"
Sequence placing events in chronological order following directions noting cycles and processes observing changes over time		Language that notes cycles, processes, orders, and steps - "first of all, second, next, finally, in conclusion" - "during, after, earlier, later, before, initially, in the end"
Evaluation analysing appreciating criticizing evaluating explaining, predicting developing criteria judging, ranking	Evaluation charts rating charts or awards	Language that evaluates, judges, ranks. - "is better than/is worse than" - "consider/think about" - "pros - positive aspects/cons - negative aspects" - any words describing opinion or preference
Choice forming opinions making decisions proposing alternatives solving problems	Generating alternatives/decisions chart	Language that expresses choice can, will, must, ought, should, would, may, in my opinion I think that ... I choose ... I prefer ... I would rather ...

situations. Conversely, to engage in the process without identifying the knowledge structure limits the development of thought to that specific situation thereby missing the opportunity for transfer. Mohan points out that many excellent curricula, particularly those influenced by the Inquiry Approach, have concentrated on the thinking processes and have neglected the knowledge structures and that "ignoring underlying principles is uneconomical since it makes it difficult for the student to generalize from what has been learned to what will be encountered later" (Mohan, 1986, p. 75). What is not fully utilized is the potential awareness of knowledge structures that can be transferred to other situations, thereby making for a more independent learner.

Mohan also observed that each thinking skill is communicated with a discourse structure that is specific to that knowledge structure which can be transferred to other content or curriculum areas. For example, in the case of articulating a sequence of events, the discourse structure is likely to include chronological connectors such as 'first of all, during, and finally' regardless of whether the context is historical, chemical or personal. Once learned, this discourse structure can be transferred to other content or curriculum areas. Awareness of the difference between the discourse structure used to communicate a knowledge structure and content specific vocabulary allows teachers to better plan for more effective content and language lessons. With this understanding, new life is breathed into the term, "language across the curriculum".

Key graphics are the versatile tool which facilitate an awareness of the thinking processes and the language features of each knowledge structure. The visual

organization of content indicates the abstract structure of the knowledge and demonstrates the relationship between ideas. Mohan suggests two reasons for using graphics

The first aim is to communicate particular information...the second aim is more important and more general: it is to communicate the structure of knowledge, for example, to communicate about classification in general. The second aim provides for transfer of learning in order to help students communicate about classification in all subject areas. (Mohan, 1986:87)

At the same time, the lines of the graphic indicate semantic relationships and highlight content vocabulary that is specific to that activity. "The (graphic) contains a set of meaning which can be packed, unpacked, and built upon; and language provides various ways to express those meanings." (Mohan, 1986, p. 79)

Mohan initially referred to graphic organizers used within the context of the Knowledge Framework as 'key graphics'. His next publication (Early, Mohan & Hooper, 1990) referred to them as 'key visuals'. Many of the subsequent studies involving the Knowledge Framework used this term, except in Gloria Tang's work (1991b) where she referred to them as 'graphic representations of knowledge structures'. In classroom work with my students, I called them 'key visuals'. This paper will refer to them predominantly as 'key graphics', but also as 'graphics, graphic organizers, visuals, and key visuals'. My decision to use the term 'graphics' is a reflection of the nomenclature most commonly recognized in the broader educational community. However, I use the word with the understanding that it now encompasses a recognition of their role within the Knowledge Framework--as a visual representation of knowledge structures, that highlights the thinking skill and replaces the verbiage of

the associated discourse structure through its shape.

Mohan's treatise Language and Content (1986) focuses mainly on explaining the components and possibilities of the Knowledge Framework. Examples of various uses of the Knowledge Framework by teachers and students are scattered throughout the text. Specific strategies can be teased out of some examples or discovered in ancillary comments. In respect of graphics, he makes many suggestions for their use in the classroom along with the one that they could "...be created either by the teacher or by the students" (p. 35). However, his emphasis is on integrating the teaching of language and the teaching of content--and on developing thinking and language skills that can be transferred across situations to create more independent and effective learners. The linking of the three aspects of thinking skills, language features, and key graphics as manifestations of knowledge structures provide a brilliant and manageable tool that promised to help teachers recognize and teach these aspects more effectively. The Vancouver School Board (VSB) through the vehicle of the ESL Pilot Project, was ready to test the framework on a large scale manner and thereby develop these strategies further.

Vancouver School Board and the ESL Pilot Project

The potential of the Knowledge Framework and key graphics was recognized by Early, Thew and Wakefield (1986) who extended and adapted Mohan's theoretical framework for general use, and then went on to pilot this work in Kindergarten to Grade 12 classrooms as part of the Vancouver School Board Pilot Project, which was

funded by the British Columbia Ministry of Education Funds for Excellence in 1988.

The pilot project was undertaken in recognition of a notable change in the diversity of the student population: 47.9% of students had English as their second or additional language and came with a broad range of literacy levels. Moreover, second language research in Canada (Cummins, 1984), the U.K. (Ellis, 1986), and the U.S. (Collier, 1987; Saville-Troike, 1984; Wong Fillmore, 1983) had recently found that ESL students required from four to eight years to reach levels of English comparable to that of their English speaking peers. This was far longer than had been assumed and raised serious implications for the length and type of support necessary for ESL students. Cummins (1981) articulated a powerful theoretical framework that guided the way to the type of support that should be offered. He distinguished between two types of proficiency: Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP). Cummins noted that while fluency in BICS was easier to achieve because it involves types of language that are context embedded, fluency in CALP was more difficult to achieve since it uses the type of context reduced language common to academic endeavour. However, it is CALP that is required for success in school.

These findings combined with the shift in the makeup of their student population motivated the Vancouver School Board to commission an examination into their delivery of ESL services. An external review team composed of Mary Ashworth, Jim Cummins and Jean Handscombe identified five principles which they believed constituted the basis for quality ESL education: namely, that,

- 1) Schools should amplify and build on background knowledge,
- 2) Long term support is required to ensure academic achievement,
- 3) Interaction with English speaking peers is critical and ESL education and acculturation is a whole school responsibility,
- 4) Language and content should be taught together, and
- 5) Parental involvement should be actively sought.

The adoption of these principles led to the creation of a four year-plan that sought to develop a quality ESL program by working on all fronts: board-wide, school-based, classroom-assisted, as well as parent-supported. One of the principal goals was the development of programs and services that addressed the need for academic language proficiency by undertaking a comprehensive staff development program to train *all* teachers working with ESL students in using these strategies. The Knowledge Framework, with its' triad of 1) thinking skills, 2) discourse structures and 3) key graphics, was the methodology identified as best suited to meet the needs of ESL learners to grow in language development and content understanding

The research project out of which the initial results arose consisted of the combined observations and efforts of over one-hundred educators in eight elementary and four secondary schools. Each school research team consisted of both ESL and mainstream content teachers. The project plan was shaped by the collaborative participatory principles of action research, and involved teams in "...analyzing needs, developing strategies and sample lessons, testing these strategies and lessons in the classroom, developing methods for teachers to evaluate the effectiveness of the materials, and producing curricula and resource materials" (Early, Mohan and Hooper,

1990, p 111) This provided a tremendous opportunity for action research and staff development, not to mention student growth.

The early 1990's saw the publication of many articles, both individually and jointly, by the academics/educators Early, Hooper, Mohan and Tang. Great care was taken in documenting research results in order to measure the effectiveness of the Knowledge Framework and to lay the groundwork for future elaboration and discovery. These articles were like the construction of a building--each acknowledging the foundation of many hours of collaboration and insight provided by teachers and students working on the project, yet adding to the building their particular area of insight and confirmation. The focus of these articles ranges from the broad uses of the Knowledge Framework and its facilitation in the classroom (Early, Mohan, & Hooper, 1990; Early, 1990; Tang, 1992/93), to a more narrow focus that would interest a particular audience (Early, 1989, 1990a, 1990b; Early & Tang 1991; Tang, 1991a, 1991b, 1992).

The first of the broad papers, "The Vancouver School Board Language and Content Project" (Early, Mohan & Hooper, 1990) explained the project and focused on the expression and teaching of academic language and expository writing: "The key question is how to help students comprehend and express knowledge across a variety of topics, tasks, situations and modes" (p.116). By interviewing ESL students to establish the difficulties they experienced, and then examining the implementation of one of the units in the classroom, several findings were confirmed. Firstly, that teachers were able to develop materials built around the organizing structure of the

Knowledge Framework, and could easily adapt their present teaching strategies to them. Secondly, that the use of graphics led students to move beyond narrative writing and reading to work in an expository mode. Students could comprehend and produce expository discourse because task structures and expectations were clearer. Moreover, teachers found that language use could be extended and developed in a variety of ways with graphic support, which allowed students to express content using their own voices.

In another of the broad papers, "Enabling First and Second Language Learners in the Classroom" (1990b), Early also used a case study to "describe how teaching of language and teaching of subject matter knowledge can be brought together in a way that both empowers students and fosters a positive attitude toward their own abilities and to knowledge" (p.567). This case study further illustrated that the Knowledge Framework was an effective organizer around which teachers could build tasks and materials to fit their existing instructional practices and to meet the proficiency levels of their diverse students. It also indicated that both first and second language students could produce high quality academic texts when adequately supported by use of graphics and directed language teaching to elicit certain knowledge and discourse structures. Early went on to make the claim that with a little conscious planning, good language and good content teaching could simultaneously be attained, and that ESL students needn't be isolated and have CALP postponed until BICS is achieved.

The other type of article arising out of the research sponsored by the VSB ESL Pilot Project was more specific in nature. Some articles focused on the effectiveness of

the Knowledge Framework approach for a specific group of learners, such as ESL Beginning Literacy students (Early, 1990a), or on one aspect--usually key graphics--and how they could help with reading comprehension of content based texts (Early & Tang, 1991, Early, 1989; Tang, 1992). These articles were important in that they established the effectiveness of particular uses of key graphics.

"Helping ESL Students Cope With Content-Based Texts" (Early&Tang, 1991) is one of the papers that explored the use of graphics as a pre-reading strategy. The paper describes a procedure for the construction and implementation of key graphics and briefly reports on an evaluative study. The study, based on a pretest-posttest nonequivalent-control-group design, was replicated in three different classroom settings--Grade 8 Social Studies, Grade 11 Social Studies, and Transitional ESL. The results in all three settings strongly supported the hypothesis that graphics, when used within the context of the Knowledge Framework, can assist reading comprehension and can also increase the ability of ESL students at the secondary level to increase their proficiency in reading and writing academic discourse.

Another paper, "The Effect of Graphic Representation of Knowledge Structures on ESL Reading Comprehension" (Tang, 1992) uses a design similar to the previous study to discover the effect of key graphics on Grade 7 ESL students learning. There too, the findings suggested that key graphics representing a text passage facilitated comprehension and immediate recall. As well, students in the key graphic group agreed that using graphics to present knowledge facilitated their learning.

In summary, these articles and others established certain indisputable principles

that the educators, working with the Knowledge Framework for both planning and task-based purposes, were able to confirm Firstly, that the Knowledge Framework lends itself to more comprehensive and comprehensible task development and execution and, overall, to more effective integration of language and content Secondly, that key graphics are a cornerstone--the 'mortar or glue'--between the knowledge structure and how it is represented in discourse structure and thinking skill, and the content. The graphic provides the support for the task, whether the task is generative, supportive, or evaluative.

Student and Teacher Use of Graphics in the Classroom

Once the effectiveness of the Knowledge Framework and the facilitative aspects of its triad was established, Gloria Tang (1991b) took a closer look at the actual presence and use of graphics in the classroom context through an ethnographic study of two multicultural mainstream Grade 7 classrooms By observing how students and teachers actually interacted with, used, and valued the graphics that were found in their educational environment, she was able to make several key realizations First, that students were exposed to a fair number of graphics through instruction and curriculum materials, particularly in newer textbooks where graphics were used as aids to comprehension. Students, therefore, could be exposed to graphics which represent all of Mohan's knowledge structures if the teacher were to use the manual and actively refer to the graphics whilst teaching. However, she concluded that simply having them in the curriculum was not enough: how and whether students used

graphics to facilitate their learning depended on the teacher guidance they received. Without teacher guidance, students were less likely to successfully retrieve information from the graphics, to use them to represent the content, or to even recognize them as a visual method of communication. As well, Tang found that these students had a generally negative attitude towards graphics, since they perceived their function to be more or less decorative. On the other hand, students who received teacher guidance when using graphics were more likely to reuse them to facilitate their learning.

With this study Tang established the importance of teacher guidance in helping students to read, use, and facilitate their learning with graphics. She took her findings a step further by clearly outlining the implications of this in terms of classroom practice, thereby indicating a broad approach to using graphics (1991b). The pointers she provided to teachers include: familiarizing students with graphics by using them in various modes (on overheads, in texts, in the media, on chalkboards) and for various purposes (previewing or reviewing content, facilitating and demonstrating comprehension, using graphics as an alternative to writing or especially as a way to evaluate content understanding). For Tang, it is clear that systematic teacher intervention and guidance is the active ingredient which must be added to the learning brew to help students successfully use graphics for their learning. "Unless teachers recognize the potential power of graphic representation of knowledge structures, and the role it plays in student learning, and take active steps to realize this potential, students will not benefit from graphics even if large quantities exist in the curriculum." (1991b, p. 38)

Another study by Tang (1991a), using data gathered in a pretest-posttest nonequivalent-control group quasiexperimental study and in semi-structured interviews with students, focused on the ESL student's experience with student-generated graphics used as part of a reading comprehension strategy. It was found, as measured by student recall of unit ideas and as perceived by most students, that constructing a graphic based on a text passage was helpful as a reading strategy and fostered comprehension and recall for the majority of students. However, she found that students understood the cognitive functions of graphics only after it had been pointed out to them as they were being explicitly taught to construct one

Once again, Tang articulated what this meant in terms of classroom practice. In particular, she made it clear that to actually get students to construct graphics is not an easy task to be accomplished in a week or two. She outlined a 'procedure', or guidelines, intended to systematize graphic use and facilitate its teaching. The starting point for the procedure is getting students to identify top-level text structures, and then teaching them to read, interpret and construct graphics. This includes pointing out the organizational conventions of graphics and validating their use with marks. This is accompanied by articulating the linguistic devices of text and knowledge structure, by consistently pointing out these devices in oral and written text, and then linking them to the graphic conventions that visually demonstrate the cognitive relationship. Tang suggested that recognizing linguistic devices in text and using them in writing, as well as constructing key graphics from text, takes time, practice and validation in the curriculum through marks and set tasks.

This series of articles lead to the conclusion that if teachers need to be active in articulating what graphics are, how they work, and how students can use them to facilitate their learning, students need to be actively engaged in using them, and to learn how to construct their own

THE GAP

The challenges of the 1990's classroom led me to graphic organizers. The brilliance of the Knowledge Framework--which arose out of a need to integrate language and content and used graphics as a tool to help facilitate that--made me see how thinking skills, language, and graphic organization were all key parts to consider in the planning and implementation of a learning activity. The initial papers from the Vancouver School Board ESL Pilot Project provided research validation and practical guidelines, such as how to break down a topic into the six boxes of the Knowledge Framework. As well, the case studies illustrated how to make and use key visuals. These were invaluable to me as an interested practitioner on the other side of the continent facing the same classroom challenges as those of the Vancouver School Board. I initiated the use of key graphics and the Knowledge Framework in my classroom practice, and shared the results with a colleague and in workshops within the Ontario educational community.

Further exposure to the Knowledge Framework through my attendance at the Language and Content Symposium at the TESOL Conference in Vancouver in 1992, helped to refine my ability to make graphics, and see how other teachers used them.

Within a short period of time, my own experience with understanding the Knowledge Framework and creating and using graphics had many effects. First, my planning was more comprehensive, and yet took less time. Secondly, my teaching was more focused. Thirdly, my students appeared to be learning more effectively, both in terms of content understanding and language production. And finally, I found creating visuals for classroom use based on specific texts or activities was turning me into a better learner. I was developing a much clearer understanding both of the content itself and of what I was trying to achieve in the lesson for my students. If creating graphics was turning me into a better learner, why couldn't it help my students? Tang (1991a), had also suggested as much.

This led to the main question which drove this study: "How do I systematically use graphic representation in the classroom so that students can grow from being passive users of graphics to being able to read, interpret, construct and use graphics for their own learning ends?" Secondary questions that I also had were: "What strategies could I use to do this?" and "Will my learners incorporate these strategies into their own study skills repertoire?"

This Thesis will extend the previous work on key graphics and the Knowledge Framework by documenting *this* teacher's experiential route of engaging Grade Eight learners with graphic organizers over the course of a full academic year. While the Vancouver School Board had identified some effective classroom activities along with descriptions of the procedures, and Tang made concrete suggestions for implementation of graphic use in the classroom, there was nothing in the literature that

explored systematic key graphic use throughout the school year or across the curriculum and documented the acquisition of the genre of key graphics. The goal of this study was to identify a possible route of moving students from being passive recipients of teacher or textbook created graphics to being active creators and users of graphics for their own learning ends.

RESEARCH DESIGN

This thesis describes a quest for knowledge to solve a specific problem: how to bring students along from being users of graphic organizers to being able to construct them for their own purposes. The quest--a year long research process--was conceived as a journey. The description of the research design will extend this metaphor.

Details of the Journey: Description of Conditions

The personal framework that provided the vehicle for this journey was built from several factors detailed in previous sections of this chapter. On the one hand, was the desire for my students to be empowered by new and complex ideas about the world and to be able to communicate them effectively. On the other hand, I was aware of factors that could limit their ability to do so. I was cognizant of the differences between Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency (Cummins, 1979) and I was influenced by the research on graphics and the Knowledge Framework (Mohan, 1986). I was also sensitive to the exhortations of

Delpit (1988) to be explicit despite, or along with, my belief in whole language philosophy.

This was a search for answers to questions which had revealed a gap in the research in order to ensure my classroom practice was as effective as possible. As Lytle and Cochran-Smith note about teacher research, "the unique feature of the questions that prompt teacher research is that they emanate solely neither from theory nor from practice, but from critical reflection on the intersection of the two" (1990b, p 6). This was very much the case in this journey.

The travellers were the classroom participants: the students and myself--their teacher. The forty-two students in the two Grade Eight classes who participated in this study over the course of one academic year reflected the classroom reality of the 1990's: their overriding commonality was their diversity. They came from middle class, working class, and welfare class socio-economic backgrounds, represented many different cultures, and demonstrated a range of cognitive and language proficiencies. A statistical description of the class reflects this: 57% of the students (representing both Canadian and foreign born) spoke a language other than English in the home. Of the total number of students, 38% were receiving ESL support 40 minutes a day in a withdrawal program during the French period. As well, 21% of the students were receiving in-class assistance from a special education resource teacher who provided support to the mainstream program. Additionally, students experienced varying levels of literacy support in the home and lived in family groupings of all kinds.

Most students' exposure to graphic organizers had been limited to the use of

charts to collect information or webs to generate ideas. I asked the previous year's teacher to describe if, how and when he used graphic organizers. "Yes", he replied, "*I always tell the kids it's easier to fill in a chart*". While this teacher was professionally active, particularly in the area of reading, it appeared he was unaware of the knowledge structure or linguistic devices that are graphically represented by key graphics. Folders of previous work that he passed on to me contained one large project on Canadian Aboriginal Peoples where information was collected in chart form and evaluation was limited to short answer essay questions. As well, webs abounded usually as a means of generating ideas for the writing process. Thus, while students may have been exposed to a variety of graphic organizers representing different knowledge structures in their texts, the use and construction of graphics by the students appeared limited.

The site of the journey was the landscape of the classroom. The curriculum consisted of English, History, Geography, Art and Drama, delivered using an integrated approach following the Transitions Years model. This model was introduced by the Ontario Ministry of Education in 1990 to better meet the needs of early adolescent learners in Grades Seven, Eight and Nine (Hewitt, 1993). Research suggesting adolescent learners were more at the concrete stage of development than at the formal operations stage (as suggested by Swiss psychologist Piaget), had fuelled educational reform from the top down. The Ministry recognized the need to rethink the classroom environment and timetable and to change the focus from teacher-centred to student-centred. This entailed a shift in program delivery from a subject-based rotary

system to one where content was integrated through cross-disciplinary themes, where timetables were more flexible with less rotation, and where individual student profiles--in terms of learning styles, prior experiences and interests--were taken into account. This model was encountering considerable resistance in 1992, especially from High School Teachers, where Grade 9 had been destreamed. In Kindergarten to Grade Eight schools however, these changes were accepted and implemented more readily. In my case, after prior teaching experience in the primary grades, it formalized what my classroom, and my school, were already doing.

Another institutional influence was the introduction of outcome based education, where teachers were shifting their focus from setting objectives to teaching for and measuring outcomes. Students were expected to develop certain values, skills, and knowledge-bases as articulated at the Ministry of Education level in "The Common Curriculum" (Ontario Ministry of Education and Training, 1995), and at the School Board level in "Benchmarks"--later called "Learning Outcomes" (Ottawa Board of Education, 1994).

My teaching style during the year could be described as a structured approach, where tasks had clear expectations and students received on-going feedback and guidance. I focused on curriculum content, drawing on prior knowledge or parallel experiences and reinforced it through simulation experiences, field trips, assignments and tests. Assignments were usually short term, during which students read and collected information, wrote essays, made presentations, and engaged in cooperative learning activities. Students used learning logs, and went through the stages of the

writing process for any finished product. A unit under study frequently culminated in a test and in the creation of a product where students combined what they knew with some kind of creative project. End-unit products included such things as a diary of an immigrant to Canada during the Great Migration of 1815 to 1850 (aged to look authentic), a play on Black Canadian history, and a poster presentation on physical geography. Literature was integrated into the unit and was usually historically or geographically based.

The length of the journey was one school year from 1992 to 1993. However, since I have been teaching for three years since the study was originally conducted, with the same clientele, conditions, and demands, I have had the opportunity to make the journey each year and refine my insights. Thus, while the data presented is from the original journey, the interceding years have enabled me to revisit and reconfirm the stages. Unless otherwise stated however, the quotations, illustrative examples, and graphics are derived from the initial journey.

A Map For the Journey: The Research Design

As can be seen, the design of this research project meant that the students and myself were both the subjects, facilitators and researchers of the inquiry. This is teacher research. As Lytle and Cochran-Smith argue, "...what is worth knowing about teaching includes what teachers, who are researchers in their own classrooms, can know through their own systematic inquiry"(1992, p.448). They define teacher research as research that is systematic, intentional, and based on one of four possible topologies.

The design of the research, which was in effect the map for the journey, complies with this definition: It is systematic, intentional, and employed a variety of documentation strategies that, like qualitative research, relied on multiple data sources which illuminated and confirmed one another.

The research design was carefully planned to ensure that data collection, reflection *on* the data, and the formulation of the next stage would be a systematic part of my school day. Material was collected on a daily basis through the use of an intentionally restructured teacher's daily plan book. This log was organized into four columns that ran parallel under the following headings: Planning, Observations, Reflection, Readings. The four-column system allowed connections to be made horizontally, with thoughts running vertically. The 'Planning' strand was in effect my teachers daybook, in which lessons were laid out. The 'Observations' strand recorded what actually happened, or what was said, remembered and written after the fact-- usually at the end of the day. The 'Reflection' strand contained deliberations on what had been expected through the planning, as well as what had occurred as recorded in 'Observations'. It was also the place where the next step was formulated. The 'Readings' column contained quotes from articles that gave direction to the planning and reflection strand, and validated or questioned what had been observed. Intellectual support, in the form of feedback or as a springboard to further ideas, was freely given by Professor Stan Jones and my colleague Janet Thomas, and recorded in the 'Readings' column. A portable learning log was also used as another place for intellectual rambling.

Data was also collected from the students. There were the key graphic products the students constructed during in-class, homework, or test situations both individually and with peers. These samples were constantly observed, reviewed, analyzed by the students and myself and at certain points percentages were calculated. Equally important were their comments and reflections on the effectiveness of key graphics as a learning strategy for themselves, elicited orally or in their learning logs after particular experiences, and at key points in the process (see Figure 1.5 for a learning log sample).

The direction of the journey unfolded throughout the daily research process. This process was an experiential one of unspoken negotiation between myself, as the teacher, and the student's performance. On the basis of students' performance, their reflective response on their experiences, and my felt sense of the long-term goal, the next short term goal was reshaped. The process was a narrative of personal experience for both the students and myself, where the answers to the questions that drove the study evolved on a daily basis.

Clandinin and Connelly (1994) propose that methods for the study of personal experience are simultaneously focused in four directions: inward and outward, backward and forward.

By *inward* we mean the internal conditions of feelings, hopes, aesthetic reactions, conditions of feelings, hopes, moral dispositions, and so on. By *outward* we mean existential conditions, that is, the environment or what E.M. Bruner (1986) calls reality. By *backward* and *forward* we are referring to temporality, past, present, and future. To experience an experience is to experience it simultaneously in these four ways and to ask questions pointing each way. (1994, p.417)

Figure 1.5: STUDENT LEARNING LOG

Hong T

Key Visual and History:
Mid-Term Reflection

What do we use key visuals?
Do you like using them? Why? Why not?
Do you think they help your learning? If yes, how?

History

- How do you feel about our history studies?
- Which activities do you find most useful?
- What surprised you the most about your country so far?

Key Visual

I think we use key visual to help us study, ~~you~~ ^{we} help us classify and compare info, and to keep things in order. It's easier to understand key visuals than a bunch of jot notes. It shows how things fit together. ~~They help you know~~ ^{They help you know} what you're looking at.

Usually, I find jot notes easier. I find key visual a pain in the neck sometimes, description charts especially. I enjoy using the cycle, the web, and the beam diagram. I guess I like circles.

Key visual really helps me, but I ~~am~~ ^{am} way too lazy to make ~~jot notes~~ ^{key visuals}. Jot notes are easier but key visual helps a million more better. They help me study. I could remember things more easily and show me how things fit together. ~~They help know the~~

The problem with key visual is when I had to figure out which one to use. I ~~do~~ ^{enjoy} thinking but I hate figuring things out.

The collection of data through the use of a log was originally devised to allow me an organized, graphic way of recording and connecting my thoughts. The process was like a narrative, with the log pre-organizing its unfolding. Only later did it appear

that each of these strands corresponds to the four directions proposed by Clandinin and Connelly 'Planning' had a forward focus while 'Observations' had a backward one; 'Reflection' and 'Readings' both had a simultaneous inward and outward focus as they dealt with existential conditions *and* reactions and feelings about that reality.

This was an altogether personally satisfying experience, allowing for a fluid evolution in the direction of the felt goal, while still allowing for observation and reflection on the process.

CHAPTER TWO

THE JOURNEY STAGES

Throughout the **Journey Stages** which my students and I travelled over the course of the 1992/93 school year in search of the answers to my quest to facilitate their learning, I kept a close eye on the rear view mirror to keep track of where we'd been. These stages are articulated as a result of that backward glance. Each stage will be described in terms of 1) the teacher-set purpose, 2) student and teacher actions, and 3) specific strategies that evolved to meet learning needs as they revealed themselves.

While the stages are described as distinct, the actual movement between stages was blurred. What this means is that while some students in their individual work might have been working at a more advanced level other students still required support and reassurance.

A critical principle which remained constant throughout the journey was that key graphics were a medium through which content was communicated. The use of key graphics was always as a means to an end--the focus was foremost on the content, thinking or language task on hand, and then on the features of the graphic that would assist in understanding, supporting, or reconstructing that knowledge. Occasionally, learning strategies were the focus for a class activity. In those cases, graphics were both the content, as one of many possible learning strategies, and the medium. The acquisition of the genre of key graphics was my intellectual preoccupation, but my

professional preoccupation was that my students acquire the knowledge, attitudes, and language and learning skills that would help them meet the learning outcomes for their grade level and indeed, help to better carry them through life.

The content focus varied with whatever subject was at hand--English, History, Geography, Art or Drama. These subjects were taught in an integrated fashion, so that the focus was simultaneously on language use and content understanding. The information that was presented graphically was either derived from various other genres--from written text, oral communication such as speech or lyrics, visual communication such as films or illustration or based on prior experience or knowledge. While the major focus of graphic use in teacher manuals and strategy books is text-based, we used them in the classroom setting with other modes of communication such as oral language, films, and drama.

The functions of the graphics--the broad range of ways in which they were used in the classroom throughout the journey--are grouped under three general categories: as a scaffold, a springboard, or as a tool to develop other skills. Additionally, one use that was primarily teacher-focused was as a tool to access summative or formative evaluation. Figure 2.1 classifies and lists the functions of graphics as they were used throughout the year.

Figure 2.1: USES OF GRAPHICS THROUGHOUT THE JOURNEY STAGES

STAGE ONE: MODELLING

- The purpose of this stage was to introduce students to either a new use or a new type of key graphic.
- As a teacher, my actions consisted of explicitly naming the graphic and its features, and modelling its use at the overhead. This was often as an aside to the language or content task at hand

Graphics were initially used informally to support teacher talk. Teacher talk: *"We have three learning outcomes we're going to focus on this year. (Hand movements were following the lines of the classification tree). This structure is called a classification tree, and the branches of a classification tree groups things. Have you ever used a tree before? Can you remember when?....Well, this classification tree groups the three types of learning outcomes which will be our focus for the coming year: growth in knowledge, growth in language skills, and growth in learning and study skills."* (See Figure 2.2)

Figure 2.2: CLASSIFICATION TREE TO SUPPORT TEACHER TALK

Graphics were formally introduced when they were used for text-based purposes. A blank key graphic was presented at the overhead. Through answers elicited by means of directed questions, the students articulated the organizing features of the graphic. I explained to them how this served as an advance organizer that would give them an idea of what to expect, as well as providing the questions that would guide their reading for information. Students completed it, and the activity was taken up at the overhead to confirm the accuracy or appropriateness of the information collected. (See Figure 2.3a and 2.3b.)

Key graphics were also introduced as one of the many strategies they would be learning to use during the school year. After much initial confusion about whether to use a 'jot note' or a 'key visual' to collect information, key visuals were explained as jot notes further up the evolutionary scale: jot notes were facts, while key graphics were facts already organized to show how the facts were connected to each other. The emphasis on the difference was to "*Let the shape do the talking*", in order to save time, save handwriting, and make summarizing, understanding, and remembering easier. Eventually the brevity of the 'jot notes' came to be seen as one of the organizational features of a good key graphic, the other aspects being appropriate use of titles and subtitles, source citations, accurate information, and appropriate choice of key graphic. (See Figure 2.4)

Figure 2.3: MODELLING GRAPHIC USE

2.3a: BLANK GRAPHIC

DEVELOPMENT OF WRITING IN HUMAN HISTORY

Approximate Time	Who	What they used

A change came about when

2.3b: COMPLETED GRAPHIC

DEVELOPMENT OF WRITING IN HUMAN HISTORY

Approximate Time	Who	What they used
Early Human History	Cave dwellers	Pictographs, cave paintings, animal tracks

A change came about when the first writing was invented

Figure 2.4: CLASSROOM POSTER

This led to using key graphics as a springboard for writing. Students re constructed the knowledge they had collected in their graphic into written text. At the overhead the whole class suggested sentences to use as the first paragraph for their essay, and were shown how a new category--such as the next column in a description chart or the next branch of a classification tree--would signal the start of a new paragraph.

In terms of modelling thinking skills, graphic use implicitly developed thinking skills throughout the study as students were actively engaged in their work. Thinking skills were not referred to directly as 'thinking skills' since students seemed confused by the terms used to express what they experienced very concretely as--thinking! Students saw the act of 'thinking' as a more original activity than organizing facts. Thinking in their view referred to generating ideas or developing opinions. Key graphics that helped them do this were webs or decision-making charts. (See Figure 2.5) Instead, thinking skills were referred to as the organizational action and then paraphrased. An example of teacher talk might be: *"What you are doing with the information is classifying, or grouping it into similar types."* It was also referred to as what the teacher or assignment was asking you to do with the information (e.g. classifying, sequencing, making choices, etc.).

Figure 2.5: DECISION-MAKING CHART

Decision-Making Chart			
Issue to be Solved	Alternative	Consequences	Decision
The Loyalists and the Canadiens want different things and have different ways of doing things. How should we deal with this?	1. Deportation	- where do the put them? - They are too many people and would probably force war	Isolation
	2. Partition <i>status quo</i>	- British loyalists would be upset might rebel - French - happy	
	3. Isolation	- Both would be happy	
	4. Assimilation	wouldn't work. Neither culture would allow themselves to be absorbed into the other	
	5. Biculturalism	- a good solution but not highly possible	

● STRATEGY: BINGO!

When using a key visual to support reading, students initially had difficulty recognizing where the key information in the text was located. This is consistent with other research on reading comprehension (Morris & Stewart-Dore, 1984). To address this difficulty, a strategy called BINGO! was used whenever when we were reading a text which I assessed to be particularly complex, or for which we had little background knowledge.

As a group we identified the type of information that we were looking for in the text as suggested by the organizational structure or sub-titles of the graphic. I read the text out loud, stressing through intonation and speed the various linguistic cues that led to the key points, and were in fact replaced by arrows and visual organization in the graphic. When a student judged we had come to such a point they shouted, "BINGO!", and then told us what the fact was, what category in the organizer it fit into, and what language or content clue had tipped them off. Both the teacher and students recorded the information in the appropriate spot on their key graphic and continued reading. As the reading went on the students would become more adept at recognizing the information with the result that my intonation cues decreased.

● STRATEGY: GROUP MUMBLE

When using a graphic to generate both oral and written language, students initially had difficulty using the appropriate academic language to express the ideas contained in the key graphic. Either they lacked the language bits, such as cohesion

devices, or didn't use content vocabulary that was specific enough (as an example in the last chapter shows--calling the elected leaders of different levels of government "heads")

To overcome this difficulty, students were asked to express the ways an idea in a specific key visual might be articulated. They either wrote them down or spent two minutes in a whole class silence thinking about them. Individuals then shared their examples. In the case of a classification tree, individual students might offer sentences that began with, "There are three levels of...", or "*There are three types of...*". These student contributions provided a model of good language use.

In order to give all students the opportunity to articulate the ideas and try out the different linguistic devices and content specific vocabulary before committing themselves to paper, a strategy which came to be known as the GROUP MUMBLE was instituted. In a GROUP MUMBLE, the class talked all at the same time, articulating the ideas in the identical key visual. Later on when students were asked to comment on the effectiveness of different strategies for their own learning, a majority indicated that the GROUP MUMBLE was useful because it, "*...let me try out saying it, and let me hear how others said it at the same time without getting embarrassed.*"

STAGE TWO: SUPPORTED USE

- The purpose of this stage was to build on previous experience and to increase speed and comfort in using key graphics.

- Once students had been introduced to a particular use or type of organizing structure, they no longer required the explicitness of modelling. However, they were given support in the form of a partially completed key graphic (where the completed segments acted as guidelines or markers to the text), or in the form of texts that had organizational structures similar to texts that had already been modelled
- Key graphics began to be included in test situations. Generally, my tests were constructed so that three parts of a student's learning was evaluated: content knowledge, language use, and study skills. The knowledge part focused on understanding, application and recall of the content. Language use was usually evaluated through a take home essay or shorter essay-type answer done in class. The evaluation of study skills consisted of a detailed articulation of individual study habits, and reflection on which study strategies and classroom routines helped them learn best. Graphics played a role in each part of the test. In the knowledge part, they provided a tool for quick summative evaluation. In the language use part they provided a support for the essay and short answer questions. And in the study skills part, key graphics were both one of the study strategies and one of the study strategies reflected upon. Figure 2.6a shows a test where the graphic verifies content knowledge while providing support to language use. Figure 2.6b shows how graphics as a study strategy, called a 'mind map' or 'study map', provided an organizing overview to a unit.

● Five strategies were developed at this stage. Three of them--CIRCLE AND EDIT, GRAMMAR EXERCISES, and LANGUAGE DETECTIVE--were instituted to support recognition and use of the linguistic devices that would help students both identify knowledge structures, construct graphics from text, and reconstruct the knowledge in written language. MATCH-UP was a text-based activity to support thinking when the content was complex, or the text structure not 'friendly'--in the sense of having clear linguistic markers. It was used primarily with cause and effect types of activities. CONSOLIDATION SKITS was a support to reconstructing the content (particularly description and sequence types of activities) through drama.

● STRATEGY: CIRCLE AND EDIT

CIRCLE AND EDIT was a strategy specifically developed to facilitate an awareness of linguistic devices. It involved having students individually and independently write from graphics. I chose samples of good student models which were shared on the overhead, and then the class generated other examples of different constructions which expressed the same idea. Students returned to their work to circle the linguistic devices they had used, and where possible, edit-in some new terms. Occasionally a second draft was done in order to hand in a polished product.

The following example is based on a lesson comparing the two groups in government in Lower Canada at the time of the 1837 Rebellion. Essays which compared the two groups were based on a Similarities/Differences chart (Figure 2.7a), and evoked the following kinds of responses. "The Chateau Clique had control

of the Legislative and Executive councils, WHILE the Parti Canadien controlled the Legislative Council." "The Chateau Clique was rich and powerful. COMPARED TO THEM, the Parti Canadien had some wealth because they were mostly professional men, BUT not as much." Afterwards, students returned to their work to circle the language structures that showed they were comparing, and tried to improve on their constructions by adding a more sophisticated term. The student in Figure 2.7b on two occasions edited the term 'but', to add in 'while' and 'compared to'.

Figure 2.7a: SIMILARITIES / DIFFERENCES CHART

Figure 2.7b: CIRCLE AND EDIT STRATEGY

● **STRATEGY: GRAMMAR EXERCISES**

GRAMMAR EXERCISES followed a similar rationale. It involved pausing in the middle of a content lesson to specifically teach a few linguistic devices that directly related to communicating the ideas in a key graphic. Students then spent approximately five minutes trying out the construction by writing three sentences using the content at hand, and three sentences using content from their own life (see Figure 2.8).

Figure 2.8: GRAMMAR EXERCISES

Margaret Williams

Grammar Exercise: Comparing Information.

1.

- While the French explored inland looking for fur, following the Native guides, the British waited for the fur Native to bring it to them.
- Whereas the French fur trade was controlled by the government, the British were controlled by Merchants.
- Although the French were more interested in colonization, the British merchants who formed the Hudson Bay Company were more interested in profits.

2. Examples from my life:

- While I live in an apartment, my friend Sarah lives in a house.
- Whereas I walk home from school and to school, my friend Jennifer takes a bus.
- Although I enjoy playing sports, my friends enjoy watching sports.

● STRATEGY: LANGUAGE DETECTIVE

LANGUAGE DETECTIVE was another relatively brief activity designed to heighten awareness of linguistic devices. Before we started reading, we would play LANGUAGE DETECTIVE by skimming the text, looking for the linguistic clues which would indicate how the author had organized the information.

We then took up the work at the overhead where students would rationalize their organization of particular facts (Figure 2.9b). In this way they could affirm or correct their work before gluing it into their notebooks. The opportunity to physically manipulate and rearrange the facts while returning to the text without committing themselves in writing, seemed to allow the students the freedom to play with the ideas, and facilitated content understanding.

Figure 2.9b: STUDENT'S NOTEBOOK

● STRATEGY: CONSOLIDATION SKITS

CONSOLIDATION SKITS involved dramatic presentation of material. Students had already used the description chart that was the main tool of the activity (Figure 2.10) in order to collect information, and were therefore familiar with the categories and the specific information which they had gathered. Students were given individual slips of paper with one fact on it, and had to move around the classroom comparing their 'fact' with other students' facts, until they had grouped together everyone in their section. The group then prepared a skit incorporating the information which would dramatize the facts for their peers.

Figure 2.10: CONSOLIDATION SKIT CHART

Year	Black Canadian History		
	Event	Significant People or Number	Contributions and significance
1608	First Europeans come to Nova Scotia	Mattijou De Costa	-translated between French and Mic Mac
1628	Slavery starts in Canada	Oliver Le Jeune	-The first slave worked as a ^{he}
1689	King Louis gives permission to take slaves (legal)	King Louis 14 th	They permitted ^{persuaded} him to legalise slavery
1760	British invaded New France The Conquest	total 1764,000 slaves 1,000 Indian slaves 3,000	-change of colonial ruler did not change status
1775 1783	a) American war of Independence ↓ b) slaves settled in Maritimes	-Refugees fled -white loyalist - 9,000 + 2,000 slaves -black loyalists 3500	-fought for freedom and loyalists -W.L. settled ^{upper} Canada -B.L. settled N.S.) + NS/NS

STAGE THREE: NEGOTIATED USE

- The purpose of this stage was to assist students in identifying which key graphic to use to organize the information they were reading or learning about. Based on their previous experience, and negotiations with the teacher, they started to identify and create the appropriate key graphic

- We began informally as soon as the students showed comfort with the Supported Use stage. Verbal connections were made to past examples--focusing either on the thinking skill or language structure that had been used. Following are examples of teacher talk for both situations.

Thinking skill: *"When we classified the purposes of the newspaper which type of key visual did we use to organize that information?...Now we want to classify the three changes to Upper and Lower Canada, so what should we use?...Good idea!"*

Language Structures: *"When we read the article on the Development of Writing in Human History, what were the terms we came across that told us the author was telling us a string of things that happened in a sequence?... Now, skim through this article and see if you can find any of those same terms...Yes? Okay, then, what kind of key visual should we use to organize this information?"*

- Formally, the class participated in a lesson where groups of students reflected on their use of key graphics by reviewing previous work, naming all the different types of key graphics they had encountered, and organizing them into groups that performed the same function. The function was in fact the thinking skill, but defined according to the specific skill, as in "comparing information" or "classifying groups". Language

structures to express those ideas were also added to the charts in an ongoing fashion throughout the year. Essentially, the key graphics were organized by the class into the Knowledge Framework. (See Figure 1.4 for a compilation of the class charts that were hung around the room for the remainder of the year.) Figure 2.11 is an example of a chart students were given to do in a similar group activity in another year.

Figure 2.11: GROUP REVIEW OF GRAPHICS

Figure 2.11 USING KEY GRAPHICS <small>Name: _____</small>		
If the teacher asked you to answer <u>this</u> question...	...which graphic could you use?	...what are some language terms you would use to express it?
...Classify the groups ...what are examples of this group?		There are several groups of...
...Compare the info. ...Describe the groups		...and ...
...What is the sequence of events ...what is the cycle		...and ...
...What are the causes and effects? ...what are the problems + solutions?		...and ...
...what are the pros + cons? ...evaluate the issue / rate the issue		...and ...
...look at alternatives and consequences ...make a choice		...and ...

- Students began constructing key graphics within larger assignments. One example of this was of a geography assignment where students had to pose a question about physical geography, research the answer from multiple sources, and then teach the class using a one page key graphic at the overhead. Graphics were constructed as part of the research design depending on the knowledge structure underlying their research question, as part of the information collection, and as the tool to assist the final presentation. This process incorporated two factors which made the assignment part of the Negotiated Use stage: first, the construction time took place in class with the Knowledge Framework charts on the walls when I was available to act as a guide or sounding board, and second, students had to hand in first draft samples for assessment before they made their presentations to the class. Figure 2.12a and 2.12b show first and second draft samples, figure 2.12c and 2.12d are additional examples from the same assignment.

STAGE FOUR: SHARED CONSTRUCTION

- The purpose of this stage was to allow students to create, share and then compare construction of key graphics. The creation was done individually or in pairs; the sharing and comparing was done in small groups and with the whole class.
- This stage involved a shift of control from myself as teacher mediating the choice of the appropriate key graphic, to the students making and justifying their choices to their peers. There was a sense of trepidation and risk involved in the sharing and comparing, but this was hopefully lessened as the emphasis was placed on the

Figure 2.12: NEGOTIATED USE STAGE: PHYSICAL GEOGRAPHY PRESENTATION

Figure 2.12a: FIRST DRAFT

Figure 2.12b: SECOND DRAFT

Figure 2.12c: DESCRIPTION CHART

What were the different Eras?
What were they like?

by Jeremy &
Dan

What time the Era started	What time the Era ended	What the major lifeforms and plant life in each Era
Scientists have not been able to narrow it down to a certain year	Not Known!	There were no lifeforms or plant life during this era
More than 600 million years ago	4 billion years nearly 90% of the earth's history	Single bacteria made one cell
About 600 million years ago	around 375 million years after it started	Thousands of different kinds of plants and animals evolved in the oceans (sea plants, and algae)
About 225 million years ago	lasted about 160 million years	dinosaurs and other giant reptiles evolved
About 65 million years ago		mammals evolved (horses, monkeys, and many larger animals, that are extinct)

Source:

Figure 2.12b: WEB, CAUSE AND EFFECT CHART

strengths and weaknesses of the key graphic in successfully communicating the critical points, as opposed to the absolute correctness of one choice over another

Nevertheless, a great deal of trust within the classroom was needed as students shared their first independent efforts at identifying text structures and creating appropriate visuals from the 'information' that was part of their daily class subject material

● STRATEGY: ROUND ROBIN WITH NOTEBOOKS

ROUND ROBIN WITH NOTEBOOKS was an informal manner of comparing key graphics. Students created their graphics individually, usually as part of homework assignments. In class they compared their efforts by circulating them within their group in a cooperative 'round robin' (a cooperative activity where everyone takes a turn). Upon returning to their notebooks, students altered the graphic if they judged it was necessary to adjust either the content or the organizing structure. This allowed the student not only double or triple access to the knowledge, but reinforced the idea that information could be organized in diverse ways depending on your focus. It also encouraged students to learn from each other. One student commented, *"It really helped me to see how others did it. I could go back to my own work and add more information. And somebody changed theirs because of something they liked that made sense in my key visual."*

This strategy was particularly useful in the case of a whole class novel study. The novel African Journey by Blaine Marchand (1990) followed three different characters, with the setting and focus of the narrative changing frequently. For English

as a Second Language students this was sometimes confusing. By doing chapter summaries in the form of graphics (Figure 2.13) instead of written texts or as answers to comprehension questions, I was quickly able to ascertain whether they had understood the sequence of the narrative, and they were able to have a second take on the action as they read other's notebooks during the ROUND ROBIN.

Figure 2.12: CHAPTER SUMMARIES WITH ADJUSTMENTS

This strategy had the added benefit of demonstrating positive notebook models, as well as encouraging homework completion once students knew they would be sharing their notebooks with their peers. "*Miss, are we going to be sharing our notebooks in a Round Robin tomorrow?*", was a question I frequently heard that led me to use this strategy more often than I might otherwise have!

● STRATEGY: COMPARING GRAPHICS

Throughout most of the study the focus was on the organization of content. However, this stage involved a formal comparison and analysis of student created visuals based on the same text information. Groups discussed the text, constructed a graphic (sometimes after individuals had done one for homework), and presented it at the overhead. I then took over at the overhead as the rest of the class critiqued the graphic according to its strengths and weaknesses. Student observations covered the full spectrum of the textual features of graphics. They commented on how appropriately the choice of a graphic represented the text structure, suggested changes of titles and subtitles, evaluated whether critical content was included and noted whether the jot notes were either brief or detailed enough.

The following example is based on a text involving Black Canadian history in British Colombia (Figure 2.14a). It shows that through this experience students demonstrated and further developed their understanding of text structure, and were able to critique both their understanding of the content and their organization of it.

Figure 2.14a: TEXT FROM Carter, V & Carter, L (1989) THE BLACK CANADIANS (Reidmore Books Edmonton, Alta.) p.49-50

BBLACKS ARRIVED in the area that became British Columbia during the 1850s. Many of them came north to escape discrimination in California. This chapter presents several portraits, or stories, of the fascinating lives of Black people in British Columbia.

The Canadian West Coast has its own history of settlement. Vancouver Island and the mainland were claimed and settled by the British. This territory became an official crown colony in 1858. By this time, the Fraser-Cariboo gold rush had brought thousands of mostly American prospectors into the area. They spread rumours that they

were going to take over the territory in the name of the USA. This was not an idle threat. It was a real possibility. The approximately 1000 British citizens of the region would be unable to stop such a takeover. And there were no British troops in the area.

James Douglas was the governor of Victoria at that time. Part of his plan to counter the American threats included Black immigrants. He needed immigrants who could be trusted to support the British. Black Californians were such a

group. Douglas knew that Blacks were not wanted in California and would gladly come to British Columbia where the economy was booming.

Figures 2.14b to 2.14f illustrate some student graphics. The darker, different handwriting indicates the oral responses of the students elicited at the time of the presentation as recorded by myself at the overhead. Figures 2.14b, 2.14c, and 2.14d show samples where the content is discussed in terms of text structure and graphic organization. Figure 2.14f elicited a collective sigh among the students, as they recognized a structure that communicated meaning very efficiently--almost like a key graphic work of art! Figure 2.14e was notable for the fact that the students concluded that the group had tried to write an essay before understanding the information. Overall, this type of comparative activity was extremely useful for highlighting, both to them and myself, how much they understood.

Figure 2.14: SHARED STUDENT-CONSTRUCTED GRAPHICS

Figure 2.14b

Why they came to BC

- Many blacks came to escape

discrimination

They also came for the
gold rush (Fraser Cariboo goldmines)

US well business opportunities
were becoming available.

Aman named James Douglas Governor of
Victoria needed immigrants that he
could trust to support the British

Also to get on with their lives.

- followed the text, not the
order of importance
- no dates

Vi-Binh
&
Jennifer
&
Och

Goldrush why
takeover runs. discrim. economy
growth

Figure 2.14c

key $\Rightarrow$ Visual
on
Why Blacks came to Canada?

B.C. settled by Fraser Cariboo gold
British. Became official $\Rightarrow$ rush brought 1000's
of Americans
James Douglas
Governor of Victoria
prospector into the
area. $\downarrow$

needed any immigrants
who could be trusted
to support British income
? war broke out.
 $\downarrow$

He invited Blacks from
California to come to Canada.

$\downarrow$
also
They came to escape this was
discrimination.

Written by Kinwa, Nicole, Abdi,
Ashraf, Stephanie

- clear
- organized well
- has dates, events, numbers, people
- shows events in order of happening,
NOT in order of how it is in text.

Figure 2.14d

Figure 2.14e

Figure 2.14f

STAGE FIVE: INDEPENDENT CONSTRUCTION UPON TEACHER DIRECTION

- The purpose of this stage was to build confidence and deepen experience in using graphics as tools for larger projects, and as part of our everyday classroom routines
- By this time students had been creating and using key graphics as a matter of course. However, I continued to direct attention to them by explicitly incorporating them into classroom routine. A typical homework assignment might be, "Read page 57-59 in your textbook, and collect the information in a key graphic." Key graphics also continued to be used as tools for larger projects.
- Key graphics had been used for evaluative purposes since the Supported Use stage. This stage, however, took evaluation a step farther, in that agility with key graphic construction was directly evaluated in the test situation. This was done by supplying students with a text that was indirectly related to the subject under study, from which they had to construct a graphic. The criteria for an effective key graphic rested on three elements: first, on the actual organizational structure (which might or might not have reflected the predominant thinking skill inherent in the text but did make sense), second, on the inclusion of the most critical content; and third, on the literacy features like titles and subtitles. The test results on four occasions in two classes showed that 85% of the students had constructed graphics judged to be effective at 8 out of 10 possible marks. In the following example (Figure 2.15), one particularly adept student organized the information into three effective key graphics!

Figure 2.15: GRAPHIC CONSTRUCTION IN TEST SITUATION

STAGE SIX: INDEPENDENT CONSTRUCTION

- The purpose of this stage is for the learners to use the skill of graphic construction and organization to fulfil their own communication and learning needs
- From the point of view of a Grade 8 teacher, where students pass on to another level of the education system, the success of this goal is hard to ascertain except in the case of long-term studies. In the short term, the final two tests of the year included a study skills section where students were asked to collect information from a provided text in whatever format they felt was most effective for them. Of the 40 students who took the tests, 38 collected their information by constructing graphics, while only 2 preferred jot notes.
- Student comments which were collected from learning logs and from opportunities to reflect in writing on all the strategies we were using in the classroom, demonstrate a real awareness of the learning potential offered to them through key graphic use. Following are SIX types of the most commonly expressed sentiments, collected from the two groups over the course of the year

1. Key graphics assist in understanding content

-It helped alot...in understanding how different things fit together

-Julianne A

-It help me to remember whatever I learned a lot better because the number of connection which jot note doesn't had.

-Minh T

-It had all the important details but it wasn't filled with words

-Jeff S.

-They sort out all the main ideas into something I can understand

-Bob D

-It's easier to understand than a bunch of jot notes. It shows how things fit together. They help you know what you're looking at

-Hong T

2. Key Graphics assist in remembering content

-It's made me remember longer.

-Jameswin S.

-They stick in my head a lot better than if I just write something down

-Julian W

3. Key Graphics support language development

-You learn two things at once. How to write, and what you learned on the subject.

-Shannon L.

- It is easier to see where the information is in the text

-Julianne A.

-It helps me know what the teacher is talking about and what they want me to do. It really got me organized for school works

-Sarom Y

4. Key Graphics save time

- It covers the basics of the subject. it talks about it (the subject) without having to write a whole lot

-Jeff S

- Before I would practically copy every single word. Now I could pick one subject and expand the information.

-Sophear S

5. Key Graphics are a more effective alternative to jot notes

-Jot notes and key visuals are both filled with collected information. The difference is that a key visual is neater and easier to understand. You can only write a jot note one way, while you can use many many different key visuals.

-Hui Hui S

-Key visuals are more organized and jot notes are scattered everywhere.

-Jennifer S

6. Key Graphic's are fun

- It's a real and fun way to organize my work.

-Julie B

Figure 2.16: STUDENT RATING SCALE ON GRAPHICS

Whether or not students are given support or encouragement to continue using graphics for their own learning needs depends on various environmental factors, e.g. other teachers' awareness or flexibility regarding different modes of representing, collecting and using information. A former student who visited from high school told me that he continues to use key graphics despite the fact that none of his teachers do. In another example, a colleague taught her learning disabled son to use graphics at home. Key graphics are particularly useful for someone with his kind of language processing problem as he has difficulty seeing the relationship between ideas as readily as other learners. When he was in Grade 7, his History teacher told him to put his work into jot notes. Once in high school, his Special Education English teacher also told him to do the same.

In any case, while the skill to construct key graphics might lie dormant or be discouraged, the skill to read and learn from them will continue to be useful to students in our visually oriented world where graphics are increasingly used to communicate both simple and complex ideas in textbooks, the media, sciences, business, and throughout everyday life.

The use of the key visuals was very effective. When I used the key visuals I understood my work much better. I hope they use k.v. in high school, if not I'll make my own. I recommend this to everyone.

-Daniel H.

CHAPTER THREE

LOOKING INWARDS, OUTWARDS, AND BACKWARDS

THROUGH THE LENS OF GENRE ACQUISITION

The previous chapter describes the **Journey Stages** through which my students and I passed in order to arrive at our final destination the independent construction of graphics. While satisfying to me as researcher, and hopefully of practical use to other educators, the description in itself does not fully explain the conditions which made the arrival at our destination a reality. What was it about the process that helped my students learn to construct and communicate in graphic form? Although it is unlikely I could properly de-construct acts of learning to arrive at an absolute answer to this question, it occurred to me that some insight might be found by examining the Stages --as one would with the acquisition of any genre. Indeed, it became apparent to me in the early part of the journey that parallels existed between acquiring the genre of graphic organizers and the acquisition of other genres of textual forms.

Conducting this research was only one of many concerns for me during the academic year. I had to deal with numerous other education-related issues, which I also recorded in my daybook/ research book/ learning log. In September we began a media unit on Newspapers that culminated in the publication of our own classroom paper. The following entry is dated September 29, 1992.

My big thrust (in getting them to publish a class paper) has been on modelling'-- on using models of genres as a key to figure out how to do something (That's one reason I am putting everything--directions, outlines as well as task instructions--into key visuals). The newspaper fits nicely into this modelling mode because each example is brief yet very specific. Following models reminds me of child's play, the way kid's mimic a certain style yet insert their particular content. Shawn's example really comes to mind here---a feature article for the sports section on the challenges faced by the school football team in the coming season, peppered by the observations of a good mind, hindered by terrible spelling and grammar (ahhhhhh--another issue for another time!).

A lot of their notebook work is imaginative, but seem to be examples that approximate the genre in a loose way, but do not adhere to the formats. It means they didn't look at the model from the newspaper or the key visual model? or they need more models? or need me to evaluate their work according to strict criteria? or need to look again themselves and do another draft? or need all of the above?

This is what I'm finding (about the newspaper unit) so far

This is really genre theory writing issues I'm getting into. It's just the same questions I have about how to move them along with key visual use.

How did I get from Knowledge Framework to genre theory infusing the writing process? But while I'm using key visuals as part of this process, they're also the focus of the big study itself. Maybe key visuals are like a genre, and the same problems are here-like how much modelling or explicitness do you expect before they can do it alone and use it for themselves?

This is really genre theory stuff.

In this excerpt, my concern was initially focused on how well students were approximating the genre of newspaper writing and how I could scaffold their creation of this genre more effectively. However, it suddenly occurred to me that the question "What role, if any, *can* or *should* the explicit teaching of genre features play in learning to write new genres?" (Freedman, 1993, p.224) was equally valid for the teaching of graphic construction. The role of explicit teaching interested me because I wondered how it fit into a whole language philosophy. Of particular concern was the

notion that, "Our role as teachers is best seen as 'leading from behind' by supporting the language learning capabilities of students indirectly through the activities we offer them" (Newman, 1985, p.5) Nevertheless, I had also taken to heart the exhortations of Delpit (1988) to be explicit about the rules of power as they refer to the social norms of communicative interaction for the group in power

Graphics as a Genre

It is necessary to backtrack briefly in order to establish graphics as a genre. Educators have traditionally thought of genres as large scale written text, such as fairy tales and science experiments. There is also the notion that learning new genres consists of observing models of the form, discovering or being told the rules, and then using these two experiences to create your own model (For example, I recently saw a language arts unit being implemented in a Grade Four classroom which demonstrated the predominant practice when encountering a new genre: students were exposed to folk tales by reading them, being read to, and then by analysing the structure were expected to write their own examples.)

Academics, however, have developed a broader view of genre. Carolyn Miller (1984) has radically reframed the notion of genre as social action, or as "typified rhetorical response to recurring situations" (1984, p. 159). This interpretation highlights issues of how genres evolve as responses to contexts, and suggests that textual features are not the primary concern but are secondary to the communicative purpose of the genre. John Swales also points out that "(t)he principal criterial feature that turns a

collection of communicative events into a genre is some set of shared communicative purposes" (1990, p 46)

The textual features of key graphics--in the view of Miller and Swales a secondary but nevertheless the most obvious identifying feature of this genre--includes the visual organization of the idea units or facts in relation to each other. The overall organizational shape and connecting lines or arrows replace the discourse structures that would have communicated the ideas in oral or written sentences. There are different key graphics which represent the underlying organization of different knowledge structures (see **Chapter One: Bernard Mohan and the Knowledge Framework**) Most graphics are read in English the same way text is read. from left to right and top to bottom (Singer & Donlan, 1989; Vacca & Vacca, 1989). One obvious exception is the numerical graph which is anchored at the lower left hand corner and read from the bottom up. Of note is research by Tang who suggests that graphics are structured the same across cultures, although read differently (Hooper, VSB Learning Institute, July 1993, personal communication).

The communicative purpose of graphics is both simple and complicated. It is complicated because it is not based in disciplinary knowledge--like the law essay, the literary form, or a science report. Nor is it based in situation specifics as evidenced by accident reports or grocery lists. Nevertheless, graphics may be used to support oral or written text within any of these examples to reinforce, elaborate, summarize or provide an overview. In essence, graphics cut across disciplinary knowledge and can be used whenever an author wishes to communicate concepts visually in a concise or

condensed manner, without any accompanying verbiage. Facility in the use of graphics has been called 'graphical literacy' and has been defined to mean the ability to read and understand those maps, charts, graphics, and other pictorial prose found in newspapers, non-fiction trade books, and textbooks (Tierney, Readence, & Dishner, 1990). Graphics are also increasingly found in instructional booklets, business presentations, and on television to support oral language, thus underlining the need for graphical literacy in our culture.

Genre Acquisition

The question of whether genre is learned or acquired has certain parallels to the debate raised some years ago about whether reading skills were "caught or taught" (Frank Smith, 1983). This catching phrase neatly sums up the quest for 'truth' or the 'many truths' that might allow an individual learner to actively use and create new and varied genres for their own ends. The genre movement in Australia (Martin, Christie & Rothery, 1987), represents the 'taught' end of the spectrum of belief in its most rigid representation. This pedagogical approach holds that students, even as young as those in early primary grades, can learn new genres through lessons that explicitly describe a genre's rules and formal features. This method, however, is somewhat severe in its adherence to explicitness.

Tang's studies (1991a, 1991b) on student perceptions and the use of key graphics underlined the need for systematic teacher intervention. In one paper, she describes explicit teacher guidance as taking, "the students step by step through the

tasks, or, at least, after ample examples" (1991b, p.34) In the other study (1991a) she prescribes the pointing out and articulation of aspects of the genre, and the validation of graphics with marks and set tasks. This is similar to the definition Freedman makes when outlining what is entailed in 'explicit teaching'.

... explicit discussions, specifying the (formal) features of the genres and/or articulating underlying rules...(as well as)...explication of the social, cultural, and (or) political features of the context that elicits the textual regularities" (1993, p. 224).

I took Tang's prescriptions seriously when I began this inquiry, and the **Journey Stages** describe many examples of explicit or guided teaching. However, what role did this explicitness actually play in relation to all the other factors?

Aviva Freedman (1993) in her article "Show and Tell? The Role of Explicit Teaching in the Learning of New Genres" frames the question as "...can the explicit teaching of genre features and rules enhance or facilitate the acquisition of such genres by students?" (p. 222). Freedman offers two tentative answers, which are intended as an appeal for further study. The Strong Hypothesis contends that explicit teaching is "neither necessary nor useful (if even in fact possible)" (p. 222). The Restricted Hypothesis allows for exceptions to this rule under certain carefully specified conditions. These hypotheses are based on relevant research and current disciplinary knowledge about first language acquisition, writing development, and second language acquisition. From these, Freedman considers a number of different facets that play a role in genre acquisition. These are: exposure to the written discourse of the genre; immersion in relevant contexts, attention to the role of affect and learning styles; participation in meaningfully "pushed output" (Swain, 1985); and collaborative

intervention by the teacher allowing for growth within the 'Zone of Proximal Development' (Vygotsky, 1978)

Within these parameters explicit teaching is possible providing it is done within the context of an authentic task involving relevant discourse and in the appropriate learning style. In addition, genre features should be articulated and discussed along with the "sharing" of exemplary student models. Finally, students should be given the opportunity to 'acquire' the genre features at an unconscious level.

In my view these are the conditions that need to be met in order to acquire a genre. Freedman's synthesis of the conditions which influence the learning and acquisition of genre will therefore provide the lens through which the **Journey Stages** of key graphic genre acquisition will be viewed. Another factor to be considered is the importance of the community of inquiry where engagement in dialogue is paramount (Dias, 1994; Hunt, 1994). These influencing conditions have been organized under three headings: the classroom environment, the learner and the process.

'Classroom environment' refers to the community of inquiry where the intention and engagement in authentic dialogue plays a primary role in the invention and creation of genre. It also includes the accuracy of the teacher's explicit knowledge about the disciplinary knowledge and genre features.

As to the learner, the following issues are important: the need for immersion in relevant contexts, the role that affect and different learning styles play, Swain's notion of 'pushed output' (Swain, 1985) and the frequency of opportunities to produce the genre.

'The process' refers to the dynamic interaction between the classroom environment as organized by the teacher (where the teacher is also one of the variables) and the learner. Included in this discussion is the degree to which scaffolds within a Zone of Proximal Development (Vygotsky, 1978) are used and the degree to which the explicit teaching that did occur met the conditions allowing a limited role for teaching within the Restricted Hypothesis.

Genre Acquisition: The Classroom Environment

By 'classroom environment' I mean the context which is created by the teacher within four walls as exercised in relationships and activities. Hunt (1994) and Dias (1994) both explore the genre acquisition that occurs in their post-secondary classrooms. Running like a thread through their observations of their experience is the realization that being part of a 'community of inquiry', where the participants engage in authentic dialogue (whether in writing or speech), plays a primary role in the invention and creation of genre.

I believe the condition of being part of a community of inquiry was met in two ways throughout the **Journey Stages**. Firstly, key graphic use was always within a meaningful context. Key graphics were used as stepping stones towards the building of understanding that would scaffold the creation of other genres. Therefore, the community of inquiry was constituted through participation in writing, talking, dramatizing or drawing about the subject material that the key graphic (whether teacher, text, or self-created) made more accessible. Figure 3.1 is an example of this; it

was used in small groups to evaluate events in Black Canadian history, and then used to support a whole class debate on racism in Canada

Figure 3.1 GRAPHIC SUPPORT FOR CLASS DEBATE

EVALUATING THE EVENTS <i>name Sharp</i>		
+ ... one that lived up to the promise of freedom and equality that Canada offered? (how)	WAS THIS EVENT	- ... one that reflected people's ignorance and intolerance? (how)
Came as equal - used skills to translate and learn - freeman - 1st Blackman	1604 - Mathieu da Costa	
	1628 - 1st slave; Oliver LaJuene	insulted black people - started slave ideal - only 8 yrs. old <i>don't that slavery is okay</i> - slave all his life
	1684 Slavery law	Black's had no freedom
	1760 - Conquest of New France by British	did not change status, even though rulers changed
Black slaves fought along side Loyalist - refugees fled to Canada - more Blacks free - some were important	1775 War of 1783 Independence Rebels vs. Loyalists	a) only 1/3 got land grants - 2/3 needed to get jobs - decided to emigrate b) 2,000 Blacks were brought as slaves
Growth of Africa - chose their own path	1792 - emigration to Sierra Leone	Many died on the way there
Free man - lived their own lives - more Blacks came to Canada		

Secondly, in the latter stages the students relied heavily on community engagement as they constructed, compared, and shared their key graphics with each other. This proved to be more than a mere exchanging of examples, as cautioned by Hunt, since they started to communicate with me and each other through the use of

key graphics. Figure 3.2 illustrates three examples of students' communication--one was a student's comment on a birthday card given to me by the class; the two others were created in response to what I had intended to be a short answer questionnaire about the effectiveness of our classroom activities.

Figure 3.2: STUDENT'S COMMUNICATING THROUGH GRAPHICS

Another aspect of the classroom environment is the accuracy of the teacher's explicit knowledge about the subject and the ensuing genre features. In my case, this was my first year teaching these subject areas in mainstream classes in the intermediate division, and as I had studied only two of the five subject areas at University I relied on background knowledge, personal experiences, teacher's manuals, and student textbooks to provide me with the necessary disciplinary knowledge. This is often the case with elementary school teachers, who are expected to know or be able to quickly learn about various curriculum areas in which they may have little or no expertise. Nevertheless, I was comfortable with and enthusiastic about the subject areas--although there were occasions (particularly with geography) when I was barely ahead of the students in my content plans. In terms of the genre features of key graphics, I had been using them on a task-by-task basis with my previous classes (both grade school and university), and was involved in an ad hoc study group with a similarly interested colleague, Janet Thomas. On a few occasions, when the key graphic that I had used in the class didn't work well in assisting students to access the information, I could see later that I lacked an accurate grasp of the content. Students were confused because I was unsure of what it was I was trying to communicate. Therefore, the condition of the teacher having explicit knowledge of disciplinary content and genre features was usually, but not always, met.

Genre Acquisition: The Learner

This section will explore factors pertaining to the individual learner. It is understood that the factors to be discussed must be taken *together* to make acquisition possible. Each factor, while important, is not sufficient in itself to totally foster or totally hinder acquisition.

The need to be immersed in relevant contexts was met through the **Journey Stages**. The context was knowledge building throughout the school curriculum and, as mentioned above, the key graphics were always used in context of the topic under scrutiny, and as a support for further knowledge reconstruction. It was especially in the **Negotiated Use** and **Shared Construction** stages that students had the opportunity to "experience the rhetorical exigencies as insiders within the relevant contexts, and (were) 'pushed and guided' in their attempts to respond appropriately to these exigencies" (Freedman, 1993, p. 240).

In academic years prior to Grade Eight, student exposure to the written discourse of key visuals was most frequently in the form of charts, cycles, or timelines when the topic had a scientific or social studies slant. (These were sometimes posted in the classrooms of my primary and junior division colleagues--the students' former teachers--throughout the school). In the school year during which this research was conducted, key graphics from various sources--newspapers, magazines, instructional manuals, computers, textbooks and other subject notebooks--were explicitly acknowledged and, where possible, incorporated into classroom activities. This provided an opportunity to observe and collect many models from different contexts.

That this was a valuable exercise was recently confirmed. During the present school year I have not been so diligent in acknowledging or incorporating key graphics from various sources into our activities, and when I pointed out a classification tree in a student's health notebook she responded "*That's not a key graphic Miss. See, this is my Health notebook, not my Integrated English book*." I swiftly made plans to amend my careless ways, and be more explicit about graphics from other sources once again!

Affect is another condition that plays an important role in genre acquisition, since the lower the anxiety, the greater the learning. This condition was addressed as I praised and positively recognized students, first, for the risks they took in *trying* to construct or use this genre, and second for the products they were creating and the knowledge they were developing. As well, student opinions about the effectiveness of graphics and other learning strategies were systematically elicited and acted upon in the classroom. Students were also encouraged to take more control throughout the year and were allowed to choose which learning strategy they believed would best enhance their learning. This was done through the medium of oral discussions and written dialogues between myself and the students in their learning logs.

Strategies which addressed the needs of different learning styles were deliberately incorporated into the classroom routine. The needs of aural learners were met through the strategies of BINGO, GROUP MUMBLE and also whenever learners had the opportunity, whether in small co-operative groups or whole class discussions to listen or to talk themselves. The needs of kinaesthetic learners were met through the strategies of MATCH-UP, CONSOLIDATION SKITS, or actual experiences. The

2 OF 2

PM-1 3" x 4" PHOTOGRAPHIC MICROCOPY TARGET
NBS 1010a ANSI/ISO #2 EQUIVALENT

PRECISIONSM RESOLUTION TARGETS

needs of visual learners were met through the key graphic itself, which provided a graphic support for oral and kinaesthetic experiences. Cultural factors were also taken into account. GROUP MUMBLE was developed specifically for second language students who came from oral cultures, in order to build on their oral strengths while giving them an opportunity to experiment verbally with academic language and to articulate their content understanding.

Although students must be exposed to the genre and discourse in a comfortable community of inquiry that recognizes their individual learning styles, they also need the opportunity to reproduce those genres or discourse. The opportunity to have 'pushed output' (Swain, 1985) is, in a very important way, what this whole study was hoping to achieve. The context was always meaningful as it fell within the Grade Eight school curriculum. The assignments were designed to meet the students' level of competence and to encourage graduated construction with increasingly fewer teacher cues as competence increased. Finally, appropriate feedback from peers and the teacher was provided--always in terms of the graphic's strengths--with suggestions of how to make it even more effective.

Genre Acquisition: The Process

In the **Journey Stages**, especially in the **Negotiated Use**, and **Supported Use** stages, scaffolds provided by partially completed models or teacher guidance were systematically used. Their removal over time allowed for growth within the 'Zone of Proximal Development' (Vygotsky, 1978). The role that I played as the teacher in the

first three stages, was gradually subsumed by the students themselves in the fourth stage. By the fourth stage, students had reached the outer edges of their 'Zone' as they were now able to construct and use key graphics for their own learning ends.

The question of how to proceed from one stage to the other was one of unspoken negotiation between myself as the teacher and the student based on his or her performance. Their performance and my felt sense of the long-term goal allowed for the shaping of the next short-term goal in an on-going process. Perhaps Bakhtin's notion of "addressivity" (1986) was at work here as each reshaping involved an implicit attitude towards a known audience.

Explicit teaching initially took place with my naming the key graphics as they were encountered. I would illustrate specific features and explain how the shape or arrows replaced discourse structures and exemplified knowledge structures. I then set assignments and tests where students identified and used key graphics, and taught students how to recognize text structures through language signals so that they could identify the knowledge structure and construct key graphics. Explicit teaching took place throughout the **Journey Stages**, but especially in the initial stages of **Modelling** and **Negotiated Use**. Freedman (1993) allows for a limited role of explicit teaching within the **Restricted Hypothesis**, but only if certain conditions are met.

As has been previously detailed, Freedman's conditions were met. The teaching took place within the context of an authentic task involving relevant discourse using a variety of learning strategies to meet different learning styles. The features of the genre were discussed with students while they had the opportunity to study

exemplary student models and experiment with the genre themselves. This is very clear in the **Shared Construction** stage during the **ROUND ROBIN WITH NOTEBOOKS** activity, as well as with the **COMPARING GRAPHICS** activity. These were some of the more obvious opportunities where students could recognize the relevant features at an unconscious level and internalize the rules that had been discussed.

Genre Acquisition: Conclusion

When I started this journey it was with the sense that I had to be explicit as to the uses and features of key graphics in the hopes that students would eventually be able to construct graphic organizers for their own learning or teaching ends. My data showed me that the students *did* acquire the genre of graphic organizers, and that the **Journey Stages** described the stages through which they passed, but it is only through the lens of genre acquisition research and theory, that I am able to see how this occurred, and what made the journey possible. I suggest that explicit teaching was only a part of the vehicle that fuelled the journey.

I conclude that it was an ensemble piece, if you will, where each player -- the community of inquiry, the relevant context, the exposure to many types of graphics from a broad range of sources, the role of affect, the learning style, the opportunity to use the genre to communicate or to support communication, the presence and then removal of scaffolds at the appropriate time, and the negotiation of stages by felt sense

and performance--contributed to the endeavour of making the journey possible

UNEXPECTED TREASURES: REFLECTIONS ON THE JOURNEY

The satisfaction that envelopes one after an enjoyable trip has two sources: you're glad you made the journey, but you're equally pleased to be home. However, in reading over the diary entries, and sifting through the ticket stubs, mementoes, and photographs, you come to realize a lot more was achieved than the initial scheme of journeying from one point to another. Previously uncharted territory has been uncovered, a new vista has been revealed, suggested paths beckon. Like many of the best trips, where you end up and what you saw along the way turns out to be as important as where you were planning to get to in the first place.

The aimed-for outcome of this journey was that students acquire the genre of key graphics. This was achieved, and the path we travelled through has been examined in terms of the strategies used to achieve those ends, and what actually facilitated the journey. But there were also unexpected outcomes that are like found treasures from the journey. The first of these to be discussed concerns what the use of key visuals and the Knowledge Framework did for us participant-researchers in our roles as student and/or teacher. The second explores what the research process--the undertaking of the journey--did for us as learners.

Outcomes Related To The Use of Key Graphics

For the Student

The emphasis of this study has been on acquisition of key graphics. However, since key graphics are tied up intimately with the thinking skills and discourse structures that express it, the augmentation of student's language and thinking proficiency are natural by-products that deserve long-term studies of their own.

The ability of this approach to improve students' academic language skills became evident very early in the study. The graphic held the content steady while the student experimented with expressing the information. The absence of longer phrases that are found in written text meant that students could not plagiarize the structure in both written and oral language when they were expressing content-based ideas. The linguistic gaps in the graphically-presented content meant students had to fill in the spaces with their own language use. This allowed for experimentation and a heightened language awareness as they struggled to find the words from their own vocabulary, and stretched to find new ones! The following anecdote demonstrates this.

In a unit on government in Canada, students were asked to look at their description chart to examine the various facets of the three levels of government, and identify what the Prime Minister, Premier, and Mayor had in common (see Figure 2.6a)

Shawn *Yeah, they're like, the heads* (He demonstrated he had content understanding, but not academic language use)

Ms Brockmann *Yes! You're right! What are they the heads of?*

Shawn *Uhhhh each different government*

Ms B *Right again' Now look at your chart Does it identify them as different governments'*

Shawn *No different levels of government*

Ms B *Good Now what's a different word that means 'heads'?*

Shawn *Oh the leaders*

Ms B *Right' But they're the leaders of what'*

Shawn *The leaders of the representatives in the 3 different levels of government*

Ms B *Can you put all that together now ?*

Shawn *The Prime Minister Premier, and Mayor are the leaders of the representatives in the three different levels of government*

Ms B *Excellent'*

Shawn *Oh now I get it' You want us to talk like we're lawyers or something'*

This provided the sought after 'teachable moment' to encourage reflection on how language is used in different environments. Students had the opportunity to think of the language and behaviour demands of the cultures they were part of, whether the culture of home, community or school. The language demands of the school culture were presented as 'in addition to' their other language codes, and students were encouraged to play with language in an academic context.

Other strategies also encouraged experimentation in written language in particular the strategies of Circle and Edit, Group Mumble, and Grammar Exercises. However, the distinction between what is 'learned' through conscious means and what

is acquired through subconscious means was evident. Students made limited use of 'lists' during the first draft writing of a piece--it was while conferencing or working on a piece or engaging in exercises with a first draft piece that students used new language bits, until they started to show in their first draft work. At that time, certain phrases with a sophisticated ring would also strike the fancy of the class like a fashion trend. 'Furthermore' and 'in conclusion' were notable favourites for a while. Overall, there were many cases where students' writing portfolios showed growth in written language use both at the sentence level in a more exact expression of ideas, and at the level of text organization. Samples from the portfolio of an ESL student in a year following the initial study demonstrate this.

Hinda had experienced interrupted schooling before arriving in Canada three years previous. She received 40 minutes of ESL support per day which was taken out of French class so that she was in the mainstream class for integrated English, History and Geography. She seemed to have average content comprehension and good learning skills. However, her written language was below average in the September of her Grade 8 year. Figures 3.3a and 3.3b (Short Answer Essay Questions), and the longer writing sample in Appendix A (Final Draft Essay, Writing from Key Graphics), demonstrate a noticeable contrast between the beginning and the end of the school year. There are improvements both in sentence structure and overall text structure.

Other areas influenced by key graphic use showed a growth in knowledge and an increased capacity for thinking. This is difficult to ascertain directly. However, it seemed that when the graphic held the content steady enough to allow divergent

Figure 3.3: SHORT ANSWER ESSAY QUESTIONS (GENERATING OPINIONS)

Figure 3.3a September

Question You have seen there are many values that government upholds. In your opinion, what are the four most important values of society that government upholds. As well, say why you think these values are important.

- our society needs good roads
- we should support 2 language and many cultures

Figure 3.3b April

Question In these area of our historical studies (1776-1815), what are three things that stick out in your mind the most. For each event or fact, explain what interested you and why it caught your attention.

- 4 (i) a. One thing that interested me was the War of 1812.
 - b. It interested me because I can't believe nobody won. ^{Using} I was in a class that said we had the war in our situation.
- (ii) A. What also interested me was how Upper and Lower Canada got their names.
 - b. This interested me because it was confusing. How could they tell by a river? It was so important the war was!
- (iii) A. Another thing that interested me was the Hungry year.
 - b. I couldn't understand how people could survive without food for a whole year.
- (iv) A. The final thing that interested me is that the way the Loyalists lived.

thinking to occur, students were able to grasp the information more fully and allow for truly creative convergent thinking. Examples of this could be seen in the kind of projects they produced -game boards based on evaluating the events of Black Canadian history, or long diaries where students took on the personas of immigrants coming during the Great Migration of 1815-1850 who participated in the Rebellion in Upper Canada in 1837. What was surprising about their final products was not just the creativity, which would be expected in students excited about their learning, but the factual accuracy of their products.

The graphics ensured that the basic factual content was communicated and understood. The role of opinion and anecdote as a primary source of knowledge was diminished when students understood the facts. This is important in integrated content-based learning, where students all too often rely on sketchy background knowledge and expect their creative representations to carry the day and earn them their marks. This is a bit too much like the Hollywood 'Pocahontas Syndrome'--heavy on special effects and short on the facts. The use of graphics to hold the content steady allowed students to remember ideas--answering questions like, "Does racism exist in Canada?" with details of Black Canadian history, and the date and conditions of when Chinese and Native Canadians received voting rights, instead of only school yard anecdotes.

For the Teacher

The pursuit of using key graphics led to an understanding of the Knowledge Framework which provided an invaluable aid to planning, and implementing

curriculum. As well, I came to appreciate it was not the graphic on its own accord (which nevertheless had formidable power when used properly), but the awareness of the graphic within the context of the thinking skill and discourse structure that proved most useful.

The Knowledge Framework helped me to plan better because I could quickly and effectively analyze the content and language task I was setting out for my students. By gaining a grasp of the knowledge structure of the content, I therefore understood the content itself better, and planned for its teaching more effectively. The key graphic provided the tool to assist students' thinking, debating, dramatizing, reading, and writing about that content. Additionally, the Knowledge Framework helped me develop my awareness of the academic language they would need to do this, so that I could more effectively plan for and evaluate its use. This was important to me in terms of finding the best ways to meet the moral dilemma posed in **The Challenge**--that of how to scaffold interactional styles and language codes that would ensure equitable educational outcomes for students from outside the 'culture of power'.

I began this study with the hope that I had found my answer to the challenge of meeting diversity in the classroom. I did, as my students' learning and comments attest, but reflection on the **Journey Stages** through the lens of genre acquisition reveals a more complicated dynamic at play. The danger inherent in over-enthusiasm for a new learning tool is that other effective strategies often fall by the wayside. The discussion focussing on genre acquisition confirms the value of using a variety of strategies in meeting different learning styles and needs. Key graphics are only one

strategy, albeit a cornerstone, that strengthens the other strategies it is combined with

As well, I realized there can be no contentless graphic. The use of graphics were only as effective as the content was meaningful, and contextualized. This realization inadvertently reflects some of the tenets of Whole Language. This is revelatory for me, considering that one of my concerns at the start of this study was a fear of going against the principle of whole language which says that leading from behind is more effective than direct instruction. What this has done, is facilitate a shift in my thinking about the balance of what's important in whole language that *what* you teach is as important as *how* you teach it, and that *how* you teach it can include explicit teaching that takes into consideration a variety of learning needs.

OUTCOMES RELATED TO THE PROCESS

When teachers do research, they draw on interpretive frameworks built from their own histories and intellectual interests. Because their research process is embedded in practice, the relationship between knower and known is significantly altered. This obviates the necessity of "translating findings" in the conventional sense, and moves teacher research toward praxis, or critical reflection on practice (Lather, 1986). Further, because teacher researchers often inquire with their students, students themselves are also empowered as knowers (Branscombe, Goswami & Swartz, 1992, Cone, 1990)

(Lytle & Cochran-Smith, 1992, p 448)

The outcomes for my students and myself that are a result of engaging in the process are perhaps the most powerful, or 'empowering' outcomes in the long run

For the Student

The students knew that I was engaged in exploring what was most effective for their learning. Talking to them explicitly about how key graphics and other learning strategies could help them, de-mystified the learning act and let them in on the secret of 'why' we did things. They developed a critical attitude about what was done 'to' them in the classroom. They were encouraged to give me honest reflections as to the effectiveness of the tasks and the pace of our learning and I strove to incorporate this knowledge. We became, in a sense, educational collaborators, as their responses to my questions shaped the way we did things in the classroom. The following student learning log response illustrates this.

I found it very difficult to make the dates stick in my head. It would have helped if we did more movement activities and less writing. Although the timeline helped too. Maybe we could play that skit game, like where some people have dates and others have events, and they have to find each other and then do a skit. That would be fun. And it would help me remember better.

Students also showed increasing awareness of themselves as learners with choices (see Figure 3-4). This self-awareness is critical. Research on learning strategies shows that potentially proficient students who do poorly are often unaware of the role they play--they think their lack of success in school is a result of their own inabilities. Consequentially, they lack the *self-awareness* necessary to change their study habits or learning strategies. Having students reflect on the usefulness of key graphics in our class led, accidentally, to making reflection a pedagogical habit that was validated with teacher response both in writing and in action. This assisted in making the students more self aware about the effectiveness of a broad range of

learning strategies for themselves

Figure 3.4: STUDY SKILLS SELF-EVALUATION

<u>Study Skills Self-Evaluation</u>		Name: _____
Test # <u>2</u>	Topic: <u>Government</u>	
PRE-TEST Date: _____	POST-TEST Date: _____	
<p>What do you need to know for this test?</p> <p>How Parliament is organized How Federal laws are passed Order of Canada Voting rights</p>	<p>Describe (in detail) how you studied for this test. (Include: when, how often, where, how.)</p> <p>I used the course book. I studied it thoroughly, mostly for about 15 minutes a day. I studied mostly at night, and I used flash cards to help me remember.</p>	
<p>Look over your study skills sheet. Think about how you studied last time. What will you do, or how will you study this time? Make your plan:</p> <p>Last time I made a study sheet and wrote it over 2 times. This time I will make all cards. The question on one side and the answer on the other side. ✓</p>	<p>Now that the test is over, was it effective? why or why not?</p> <p>The test was effective because I felt I studied enough. I felt I had studied long enough. You underestimated yourself! - you did</p>	
	<p>What will you do differently, or the same, next time?</p> <p>Next time I will make all cards, repeat, and study more often. Think about which worked best - the study sheet or cue cards?</p>	

For the Teacher

My active pursuit in understanding and using graphics lead to what Lytle and Cochran-Smith (1992) call a growth of both public and local knowledge. Within six months of initiating this study in my class, the design-technology teacher took an interest in key graphics and incorporated them as part of student-led presentations in her classroom (see Figure 3.6). As well, W. Mooney, the teacher who was mentioned

Figure 3.6: GRAPHIC FROM DESIGN-TECHNOLOGY CLASS

on page 31 as the "previous year's (Grade 7) teacher", and who is still teaching down the hall from me, wrote the following testimonial

In about 1992 I started teaching in the room next to Barb B and became interested in what she was doing in her classes with respect to key visuals (K.V.) I attended some workshops she gave with Janet (Thomas) and then discussed K.V.'s extensively with Barb.

After using them in my class, I quickly came to realize their power. K.V.'s provide a great framework for summarizing information, and, if given before reading, act as a guide to the reading. Information from more than one source can be put on the same K.V. thus holding the content 'steady'. This is very important for Grade 7 & 8 students when they begin to write. The greatest impact K.V.'s have had on student writing is that when they write it, it sounds like they wrote it; it gives them their own 'voice'. The addition of K.V.'s to my teaching repertoire has improved what I do in the classroom. I can't imagine teaching and not using K.V.'s. I sometimes wish I could go back to all those classes I didn't use K.V.'s with and tell them about it.

Additionally, exposure to key visuals through workshops, has led to board-wide curriculum writing teams including the use of key visuals as one of the Transition Years Learning Outcomes in Language Arts.

Engaging in this process has heightened my awareness of the conditions that play a role in any teaching/ learning process. Part of this is a sense of education as an implicit contract between student and teacher--and that my knowledge is a power that I have the responsibility to exercise to facilitate equitable educational outcomes. The tension I felt between whole language and 'explicit' teaching is no longer there. As long as the context, audience and content are both meaningful and real, the explicit teaching that takes place is a response to recognized needs. At the same time, I have confirmed my belief that I am not the only one with expert knowledge in the classroom. I have a greater respect for my learners and a sure sense that they will tell me what works best for their learning--if they're given opportunities to explore it and

know someone is listening. There *are* the means, "... to help students to establish their own voices, (and) to coach those voices to produce notes that will be heard clearly in the larger society" (Delpit, 1988, p.501).

In conclusion, this wasn't the first question I have asked regarding my classroom practice, but it was the first whose answer I pursued in a collaborative effort with my learners. It won't be the last.

APPENDIX A: Final Draft Essay; Writing From Key Graphics

Appendix A.1. September

About the Government

These three paragraphs are about the government and the stuff I learned about the government. Like that there are many governments like the Federal and Provincial and Municipal governments. I also learned that the Federal government looks after the provinces and finds the Municipal takes care of the cities. Also I have learned that across the countries and provinces they have these funds for expense programmes is transferred from higher level of government to a lower one. For example the federal transferred \$ to Province for universities and health care. Then the Provincial transferred \$ to Municipal for school board and public transportation. There are lots of other stuff about this topic I have learned like that the name of the leader of the winning party is Jean Chretien and the party he was from is the Liberal. Another thing I heard is that a Legislature is where laws are made like the parliament. The provincial government have legislature assemblies they have these assemblies at Queen's Park which is in Toronto. One more thing I have learned about tax like D.S.T. we pay 7% for g.s.t. there are other taxes like income tax and import and export tax and business tax etc. In each province there are different taxes like P.S.T. is only one of the taxes we have to pay 8% P.S.T. on things like business tax and income tax also license tax and funds. The Municipal government have it's own taxes like Property tax for houses building permits and business tax.

Appendix A.2 March

Proclamation of 1763

The Proclamation of 1763 was when the British won the seven years war. The British had some plans of how they would govern the French Canadian.

The first plan the British had was to ensure that British institutions, law, language and religion were imposed on Quebec. That was their own rule they had to figure out how their own was to be met. One of their plan of how their own was going to be met was to assimilate the French another was the British laws replaced French laws except for the civil law.

A couple of more aims were allow Roman Catholic
 and Roman Catholics weren't allowed to be
 elected. What actually happened was that the
 French language was allowed to continue. The
 British then replaced the French's law except
 the civil law. Roman Catholic got their language
 There was only one thing that didn't go
 according to the plan assimilation didn't
 happen. There were too much French about
 97% were French and 3% were British.

The British's next aim was to attract
 British settlers. They had two ideas of
 how this aim was going to be met.
 Just one was give the Roman Catholic's
 their whole religion instead of just the
 language. The other I am not sure

about it. What actually happened was the settlers from the thirteen colonies went West instead of North.

Their next aim was to limit the size of Quebec and cut the Montreal fur traders out of the western fur trade. There wasn't any information of how this aim was going to be met but. What actually happened was that Quebec got limited in size.

The British's last aim was to reassure the Native peoples that their interests in the fur trade and the Ohio Valley hunting grounds were protected. They had two ideas of how this aim was going to be met first

one is that fur Trappers and Traders were forbidden to go on the Indians' land. They decided a special government licence. The other idea was to forbid settlement in Ohio and Mississippi valley you also decided on special licence too. This one didn't work because colonists moved in this territory anyway.

In conclusion the proclamation of 1763 did not work out so well.

APPENDIX B: OVERVIEW OF THE JOURNEY STAGES

ENGAGING WITH KEY GRAPHICS **A Journey From Student Use to Student Construction**

Key Points

- Key graphics were a medium through which knowledge was communicated--as tools which were used as scaffolds or springboards to facilitate comprehension or expression. When utilized in conjunction with other strategies, such as cooperative learning or study skills strategies, key graphics improved and strengthened them by adding a visual and organizational dimension.
- Key graphics were always used as a means to an end--the task focus was foremost on the content, thinking or language task, and then on the features of the graphic which would assist in understanding, supporting or reconstructing that knowledge.
- The information which was presented graphically came from across the curriculum throughout the school year and was derived either from various genres (written text, oral communication such as speech or music lyrics, visual communication such as films or illustrations) or based on prior experience or knowledge.
- Student reflections on key graphic use were elicited on a regular basis. This was important as an avenue for students to develop awareness of themselves as learners with choices. These reflections were also a valuable source of information for the teacher in order to know which learning strategies were most effective for their learners.
- The acquisition of the genre of key graphics paralleled the acquisition of other genre, and depended on a variety of factors such as, engagement in a community of inquiry within a relevant context, exposure to many types of graphics from a broad range of sources, acknowledgement of the role of affect and learning style, opportunity to use the genre to communicate or to support communication, the presence and then removal of scaffolds at the appropriate time, and negotiation of stages by felt sense and performance.

The explicit teaching which occurred met the conditions of the 'Restricted Hypothesis' (Freedman, 1993)--it took place within the context of an authentic task involving relevant discourse, and used a variety of learning strategies to meet different learning styles. As well, the features of the genre were articulated and discussed with students while they had the opportunity to study exemplary student models and experiment with the genres themselves. Finally, students were given the opportunity to recognize the relevant features at an unconscious level and internalize the rules that had been discussed.

Stage One: Modelling

-Purpose to introduce students to a new type or use of graphics

-Teacher action explicitly name the features and model graphic use at the overhead

-Strategies

- * Bingo!--to recognize where key information is in text
- * Group Mumble--to provide an opportunity to articulate ideas and try out different linguistic devices and content specific vocabulary

Stage Two: Supported Use

-Purpose to build on previous experience and increase speed and comfort level in using graphics

-Teacher action provide support in the form of graphics which are partially completed or have the same structure as those already modelled, use within tests

-Strategies

- * Circle and Edit, Grammar Exercises, Language Detective--to support recognition and use of linguistic devices to help students identify knowledge structures, construct text-based graphics, and reconstruct their knowledge in both written and language
- * Match Up--a text based activity to support thinking when content or writing style is complex, or students have little prior knowledge
- * Consolidation Skits--to reconstruct knowledge in dramatic form

Stage Three: Negotiated Use

-Purpose to assist students in identifying the most appropriate key graphic, based on previous experience and negotiation with the teacher

-Teacher action make verbal connections to past examples focusing either on the parallel thinking skill or language structure, give assignments that require students to use graphics as part of the research design, information collection and final product or presentation

Stage Four: Shared Construction

- Purpose* to construct (individually or in pairs), share, and then compare (in small groups or whole class) key graphics based on the same text
- Teacher action* facilitate a shift of control from the teacher mediating the choice of the appropriate graphic to construct, to students making and justifying choices to their peers
- Strategies*

- * Round Robin with Notebook--students circulate notebooks and modify their self-constructed graphics if appropriate after viewing other samples
- * Comparing Graphics--formal comparison of student constructed graphics based on the same text or information takes place at the overhead. Criteria for evaluation are based on whether the graphic appropriately represents the text structure, has features like titles and subtitles, is brief, and includes critical content

Stage Five: Independent Construction Upon Teacher Direction

- Purpose* to build confidence and experience in using graphics as a part of larger projects
- Teacher action* ensure graphic use is a classroom routine, test agility with key graphic construction and evaluate and validate with marks

Stage Six: Independent Construction

- students use the skill of graphic construction and organization to fulfil their own communication and learning ends

APPENDIX C: Overview of Strategies Developed During the Journey Stages

STRATEGY	DESCRIPTION AND PURPOSE	IMPLEMENTATION
BINGO!	<ul style="list-style-type: none"> * whole class * especially helpful for aural learners and students from oral cultures * when gathering information from a text, lecture or film * to assist recognition of where key information is in text 	<ul style="list-style-type: none"> * class identifies the type of information they are looking for as suggested by the organizational structure or subtitles of the graphic, or by questions they've generated * teacher reads the text out loud (students follow along), stressing through intonation and speed the various linguistic cues that lead to the key points * students shout "BINGO!", when they judge a key point has been reached * student then says what the key information is, what category it fits into or question it answers, and what language or content clue tipped them off * students record the information * reading continues * teacher decreases intonation and speed cues as students become more adept

STRATEGY

GROUP MUMBLE

DESCRIPTION AND PURPOSE

- whole class
- especially helpful for aural learners and students from oral cultures
- to provide an opportunity to articulate ideas and try out different linguistic devices in oral language before writing

IMPLEMENTATION

- whole class is asked to express as many different ways of information in a key graphic may be articulated
- a few moments of silence allows everyone to think
- students share their examples, thus providing good examples of language use
- the whole class then talks at the same time (hence, the 'group mumble')
- this enables students to verbally try out the content vocabulary and linguistic devices themselves before committing their ideas down in writing
- at the same time, they hear how others are saying it
- students examples may be elicited again, before the writing task begins

CIRCLE AND EDIT

- individual activity within a whole class lesson
- to support recognition and use of linguistic devices to help students identify knowledge structures, construct text-based graphics, and reconstruct their knowledge in written language

- students write based on a graphic
- good student models are shared on the overhead with particular attention paid to the linguistic and cohesion devices used to express and link ideas
- class generates more examples of different constructions which express the same ideas
- students return to their work to circle the linguistic devices they used and, where possible, edit in some new terms
- occasionally, students could be required to revise and hand in an additional draft
- these linguistic devices to express certain knowledge structures could be added to class posters or individual student lists of terms to use

STRATEGY	DESCRIPTION AND PURPOSE	IMPLEMENTATION
GRAMMAR EXERCISES	<ul style="list-style-type: none"> * individual activity within a whole class lesson * to learn and practice linguistic devices used to express certain knowledge structures 	<ul style="list-style-type: none"> * whole class pauses in the middle of a content lesson, or before assigning a task at the end of a lesson * teacher teaches a few linguistic devices (eliciting the structure from the class where possible) which communicate the knowledge structure of the graphic * sentence frames or patterns are constructed out of the students examples (e.g. for comparative structures "While Whereas Although") * students spend a brief period (5-10 minutes) trying out the sentence frame by writing three sentences using the content under study, and three sentences applying the construction to examples from their own life
LANGUAGE DETECTIVE	<ul style="list-style-type: none"> * individual, small group or whole class * to look for linguistic clues in order to identify possible knowledge structures and text organization before reading 	<ul style="list-style-type: none"> * students skim a text before reading, looking for linguistic clues that would indicate the knowledge structure behind the text organization (described to the students as "what the author is doing with the information")

STRATEGY

DESCRIPTION AND PURPOSE

MATCH-UP

- * individual and small group activity within a whole class lesson
- * especially helpful for kinesthetic learners
- * to use with text whenever it is difficult to comprehend due to little background knowledge on behalf of the students, or complex content or text structure

IMPLEMENTATION

- * teacher prepares the activity by previewing the reading, noting the critical facts, and designing the handout
- * handout consists of an illustration of the bare framework of the graphic, and the individual facts listed on the page (not in order)
- * students cut the facts into strips
- * students manipulate the facts and try to organize them appropriately according to the graphic framework
- * they must return to the text, and rely on prior knowledge and common sense to help them understand
- * students discuss their organizational choices in small groups, and 'play' with the facts until they feel they have understood the facts in relation to each other
- * the task is taken up at the overhead, and students justify their choices
- * once the correct organization is achieved, students glue the completed key graphic structure into their notebooks

STRATEGY

CONSOLIDATION SKITS

DESCRIPTION AND PURPOSE

- * whole class
- * especially helpful for kinaesthetic learners
- * to reconstruct knowledge in dramatic form
- * is based on a graphic and content that students should already be familiar with
- * effective with timelines and description charts in all content areas

IMPLEMENTATION

- * the key graphic provides the organizing tool for the activity
- * students should already be familiar with and knowledgeable of the categories and specific information
- * teacher cuts up a chart into separate facts, and writes the categories on the blackboard
- * students receive individual slips of paper with one fact on it
- * students move around the classroom comparing their fact with other students' facts, assessing the information, until they have gathered all the students who belong in their category
- * each group prepares and presents a skit incorporating the information in order to dramatize the facts for their classmates

STRATEGY

ROUND ROBIN WITH NOTEBOOKS

DESCRIPTION AND PURPOSE

- * small group
- * to provide an opportunity to view multiple student examples, and critically assess one's own graphic construction
- * gives students double and triple access to the knowledge, and reinforces the idea that knowledge can be organized in diverse ways

IMPLEMENTATION

- * students construct a key graphic independently, usually as part of homework assignment
- * students in whole class pass their notebooks around in a small group 'round robin' (a cooperative learning activity where everyone takes a turn), and have the opportunity to look at other student work
- * upon returning to their own notebooks, students assess their choice and construction of graphics as well as their inclusion of critical content, and make adjustments if they deem it necessary

COMPARING GRAPHICS

- * from individual to small group to whole class
- * to formally share, compare and analyse student constructed visuals based on the same text information

- * students construct a graphic independently as part of a homework assignment
- * in class students share, compare and discuss their choices with their small group, returning to the text when necessary to justify their choice
- * small group then constructs a joint key graphic which is presented at the overhead
- * whole class critiques the key graphic: first, according to its strengths, then according to the areas that could be developed or improved
- * criteria for evaluation include: how appropriately the graphic represents the text structure, whether the graphic has titles and subtitles, is brief, and includes critical content

BIBLIOGRAPHY

- Apple, M W (1979) Ideology and curriculum Boston Routledge & Kegan Paul
- Alvermann, D.E. (1981). The compensatory effect of graphic organizers on descriptive text The Journal of Educational Research, 75 (1), 44-49
- Alvermann, D.E & Boothby, P.R (1984) A classroom training study The effects of graphic organizer instruction on fourth graders' comprehension Reading World, 23 (4), 325-339
- Armbruster, B.B. & Anderson, T H (1984) Mapping Representing informative text graphically. In C.D. Holley, & H F. Dansereau (Eds) Spatial learning strategies New York: Academic Press. 189-209.
- Armbruster, B.B. & Anderson, T.H. (1980). The effect of mapping on the free recall of expository text. (Technical Report No 160) Urbana-Champaign University of Illinois, Center for the Study of Reading. (ERIC Document Reproduction Service No ED 192 735).
- Armbruster, B.B., Anderson, T.H. & Ostertag, J (1987) Does text structure/ summarization instruction facilitate learning from expository text? Reading Research Quarterly, 22, 331-346
- Ausubel, D.P (1968). Educational Psychology A cognitive view New York Holt, Rinehart and Winston.
- Ausubel, D.P (1960) The use of advance organizers in the learning and retention of meaningful verbal material. Journal of Educational Psychology, 63, 267-272
- Bailey, J. (1992). New computers, new thoughts. Harper's magazine May 1992, 28-32
- Bakhtin, M.M. (1986) The problem of speech genres In C Emerson and M Holquist (Eds.), V.W. McGee (Translators). Speech genres and other late essays Austin, TX University of Texas Press. 60-102
- Barron, R.F. (1979). Research for classroom teachers. Recent development on the use of the structured overview as an advance organizer In H.L. Herver & J.D Riley, (Eds.). Research in reading in content areas The fourth report New York Syracuse University, Reading and Language Arts Centre 29-39.
- Bartlett, S.J. (1979) Top level text organizational strategy for recall of text (Doctoral dissertation, Arizona State University, 1978) Dissertation Abstracts International, 39, 6641A

- Berkowitz, S J (1986) Effects of instruction in text organization on sixth-grade students' memory for expository reading Reading Research Quarterly, 21, 161-178
- Black, H. & Black, S. (1990). Organizing Thinking Graphic Organizers Midwest Publications National Centre for Teaching and Thinking.
- Boothby, P R., & Alvermann, D.E. (1984). A classroom training study: The effects of graphic organizer instruction on fourth graders' comprehension Reading World, 23,(4), 325-339
- Branscombe, A., Goswami, D & Schwartz, J. (1992) Students teaching Teachers learning Portsmouth, NH. Heinemann.
- Brownlie, F. & Close, S (1992). Beyond chalk and talk: Collaborative strategies for middle and high school years. Markham, Ont.. Pembroke Publishers
- Carrell, P L (1982). Cohesion is not coherence. TESOL Quarterly, 16, 478-488.
- Carrell, P L., Pharis, B.G., & Liberto, J.C. (1989) Metacognitive strategy training for ESL reading TESOL Quarterly, 23, (4), 647-673
- Carter, V , & Carter, L. (1989). The Black Canadians: their history and contributions. Edmonton Alta. Reidmore Books Inc.
- Chamot, A U., & O'Malley, M. (1994) The CALLA handbook Implementing the cognitive academic language learning approach Don Mills, Ont. Addison-Wesley
- Clandinin, D.J., & Connelly, M.F. (1994). Personal experience methods. In Handbook of Qualitative Research Thousand Oaks, California: Sage Publishers.
- Clark, J.H (1991). Using visual organizers to focus on thinking Journal of Reading, 34, (7)
- Collier, V.P. (1987) Age and rate of acquisition of second language for academic purposes. TESOL Quartely, 21, 617-641.
- Cone, J. (1990). Untracking advanced placement English: Creating opportunity is not enough. In Research in writing. Working papers of teacher researchers. Berkeley, CA. Bay Area Writing Project.
- Cummins, J (1979) Cognitive/academic language proficiency, linguistic interdependence, the optimal age question, and some other matters. Working Papers on Bilingualism, 19, 197-205.

Cummins, J (1979) Linguistic interdependence and the educational development of bilingual children. Review of Educational Research, 49, (2), 222-251

Cummins, J., (1981) Age on arrival and immigrant second language learning in Canada: A reassessment. Applied Linguistics, 2, 132-149

Cummins, J. (1984) Bilingualism and special education: Issues in assessment and pedagogy. Clevedone, Avon: Multilingual Matters

Dansereau, F.F. (1979). Development and evaluation of a learning strategy training program. Journal of Educational Psychology, 71, 64-73.

Dearden, R F 1968 The Philosophy of Primary Education Sondon. Routledge and Kegan Paul

Delpit, L.B. (1988). The silenced dialogue: power and pedagogy in educating other peoples' children. Harvard Educational Review, Vol. 58, (3), 483-502.

Dias, P (1994) Initiating students into the genres of discipline-based reading and writing. In A. Freedman & P. Medway (Eds.). Genres in education. Portsmouth, NH: Boynton/Cook Heinemann

Dunbar, S. (1992). Integrating Language and Content: A Case Study. TESL Canada, 10, (1), 62-70.

Early, M (1989) Using key visuals to aid ESL students' comprehension of content classroom texts. Reading Canada Lecture, 1, (4), 202-211.

Early, M. (1990a). Enabling first and second language learners in the classroom. Language Arts, 67, (10), 567-575

Early, M. (1990b) ESL Beginning Literacy: A content-based approach. TESL Canada Journal, 7, (2), 82-93.

Early, M., Mohan, B. & Hooper, H.R (1990) The Vancouver School Board language and content project. In J.H. Esling (Ed.), Multicultural education and policy: ESL in the 1990's. Toronto: Ontario Institute for Studies in Education

Early, M., & Tang, G., (1991) Helping ESL students cope with content-based texts. TESL Canada Journal, 8, (2), 34-44.

Early, M., Thew, C., & Wakefield, P. (1986) Integrating language and content instruction K-12: An ESL resource book, Vol.1. Victoria, B.C. Ministry of Education, Modern Language Services Branch.

Edelsky, C , Altwerger, B , & Flores, B. (1991) Whole Language What's the Difference? Portsmouth, NH Heinemann

Ellis, R (1986) Policy and provision for ESL in schools. Oxford Pergamon

Evans, M.A., Watson, C., & Willows, D.M. (1987). A naturalistic inquiry into illustration in instructional textbooks. In DM Willows, & H.A. Houghton (Eds.), The psychology of illustrations., 111. New York: Springer-Verlag, 86-115.

Freedman, A. (1993). Show and tell? The role of explicit teaching in the learning of new genres Research in the Teaching of English., 27, (3), 225-251.

Fried, S , Shallhorn, J., & Shaw, J., (1992) Grass Roots Up: a practical guide to the transition years Toronto, Ontario OSSTF Educational Services.

Fry, E (1981). Graphical literacy Journal of Reading, 25, 383-390.

Geva, E (1983) Facilitating reading comprehension through flowcharting. Reading Research Quarterly, 18, 384-404.

Gillespie, C. S., (1993). Reading graphic displays: What teachers should know. Journal of Reading, 36, (5), 350-354.

Hanf, M B (1971) Mapping. A technique for translating reading into thinking. Journal of Reading, 14, 225-230

Hawk, P.P. (1986) Using graphic organizers to increase achievement in middle school life science. Science Education, 70, (1), 81-87.

Heimlich, J E. & Pittelman, S.D (1986) Semantic Mapping: Classroom applications. Newark, DE: International Reading Association.

Herber, H L. (1978) Teaching reading in content areas. Englewood Cliffs, NJ Prentice-Hall.

Hewitt, J (1993). Transition Years: Nurturing adolescent learners. Federation of Women's Teachers Associations of Ontario Newsletter, 11, (5), 2-8.

Holliday, W G. (1975). What's in a picture? The Science Teacher, 42, 21-22.

Hudelson, S. (1989). 'Teaching' English through content-area activities. In P. Rigg & V G Allen (Eds) When they don't all speak English: Integrating the ESL student into the regular classroom. Urbana, Il.: National Council of Teachers of English.

Hunt, R. A. (1994) Speech genres, writing genres, school genres, and computer genres In Freedman, A. & Medway, P. (Eds.) Learning and Teaching Genres Portsmouth, NH Boynton/Cook Heinemann

Hunter, B., Crismore, A., & Pearson, P. (1987) Visual displays in basal readers and social studies textbooks In D. Willows & H. Houghton (Eds.) The psychology of illustration: Volume 1 New York: Springer-Verlag, 116-135

Lather, P. (1986). Research as praxis Harvard Educational Review, 56, 257-277

Larter, S. (1991). Benchmarks In Federation of Women's Teachers Associations of Ontario Newsletter, Vol. 10, (1), 2-9.

Lytle, S.L., & Cochran-Smith, M., (1990a). Learning from teacher research: A working typology. Teachers College Record, 92, (1).

Lytle, S.L. & Cochran-Smith, M., (1990b) Research on teaching and teacher research: The issues that divide Educational Researcher, 3, 2-11

Lytle, S.L., & Cochran-Smith, M., (1992) Teacher research as a way of knowing Harvard Educational Review, 62, (4), 447-474.

Marchand, B., (1990). African Journey. Hull, Quebec, Media Sphere Youth Editions

Martin, J. P., Christie, R., & Rothery, J. (1987) Social processes in education: A reply to Sawyer and Watson (and others). In I. Reid (Ed.), The place of genre in learning Geelong, Victoria, Australia: Deakin University, 58-82

Miller, C. (1984). Genre as social action Quarterly Journal of Speech, 70, 151-167

Miller, K.K. (1988) Effects of expository passage organizers on sixth graders' reading and writing of text. Unpublished doctoral dissertation, University of Missouri, Kansas City, MO.

Miller, K.K., & George, J.E. (1992) Expository Passage Organizers: Models for reading and writing. Journal of Reading, 35, (5), 372-377

Mohan, B.A. (1986). Language and content. Reading, MA: Addison-Wesley

Morris, A. & Stewart-Dore, N. (1984). Learning to learn from text: effective reading in the content areas. New South Wales: Addison-Wesley

Mulcahy, P. & Samuels, S.J. (1987) Three hundred years of illustrations in American textbooks. In D.M. Willows, & H.A. Houghton (Eds) The psychology of illustration, Vol. 11. New York: Springer-Verlag, 1-52.

Newman, J., (1985) Whole language: theory in use. Portsmouth NH: Heinemann

Ontario Ministry of Education and Training. (1995) The Common Curriculum: Provincial standards, Language, Grades 1-9. Toronto: Ontario Ministry of Education and Training

Ottawa Board of Education, (1994) Learning Outcomes for Language Arts/English. Ottawa: Ottawa Board of Education

Paivio, A. (1971) Imagery and verbal processes. New York: Holt, Rinehart, and Winston

Saville-Troike, M. (1984) What really matters in second language learning for academic achievement. TESOL Quarterly, 18, 199-219

Smith, F. (1973) Psycholinguistics and Reading. New York: Holt, Rinehart and Winston

Swain, M. (1985). Communicative competence: Some roles of comprehensible input and comprehensible output in its development. In S. Gass & C. Madden (Eds.) Input in second language development. Rowley, MA: Newbury House

Tang, G.M. (1991a). ESL student perception of student-generated graphics as a reading strategy. Reflections on Canadian Literacy, 9, (1), 2-9

Tang, G.M. (1991b). The role and value of graphic representation of knowledge structures in ESL student learning: An ethnographic study. TESL Canada Journal, 9, (1), 29-41

Tang, G.M. (1992). The effect of graphic representation of knowledge structures on ESL reading comprehension. Studies in second language acquisition, vol. 14, no. 2, 177-195

Tang, G.M. (1992/93). Teaching content knowledge and ESOL in multicultural classrooms. TESOL Journal, 8-12.

Taylor, B.M. & Beach, R.W. (1984). The effects of text structure instruction on middle-grade students' comprehension and production of expository text. Reading Research Quarterly, 19, 134-146

Tierney, R J, Readence, J E , & Dishener, E K (1990) Reading strategies and practices A compendium (3rd ed) Boston, MA Allyn & Bacon

Vacca, R T (1981) Content area reading Boston Little, Brown & Company

Vygotsky, L (1962) Thought and Language (E Hanfmann & G Vakar, Translators) Cambridge, MA MIT Press

Wells, G (Ed) (1994) Changing schools from within. Creating communities of inquiry Toronto, Ontario OISE Press

Willows, D M., & Houghton, H.A. (1987) The psychology of illustration New York Springer-Verlag

Wong Fillmore, L (1983) The language learner as an individual In M A Clarke & J Handscombe (Eds) On TESOL '82. Pacific perspectives on language learning and teaching, Washington, DC. TESOL 157-173

Wong-Fillmore, L (1989) Teaching English through content Instructional reform in programs for language minority students In J H Esling (Ed). Multicultural education policy ESL in the 1990's Toronto, Ontario OISE Press 125-143

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