

**Challenges Facing Middle and Senior Years Teachers: Exploring Social
Constructivist Instructional Approaches and Cognitive Text-Processing
Strategies**

by

Donna Copsey Haydey

A Thesis

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in Partial Fulfillment of the Requirements
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Of

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ABSTRACT

This study examined the predominant instructional approach (transmission, scaffolded, and/or use of collaborative learning) and cognitive text-processing strategies employed by middle and senior years content area teachers. Relationships between teacher demographics (university education, year of graduation, total years teaching, gender, age, subject area taught, number of years teaching subject area, school location, and size) and instructional approach, as well as the use of comprehension strategies were investigated by means of a questionnaire. Follow-up interviews with ten of the teachers who used high levels of scaffolding and collaboration provided further insight into instructional approaches and the challenges faced in implementing social constructivist practices.

Statistical findings in conjunction with a conceptual model of instructional approaches (Straw, 2002) revealed that the teachers in this study used a mix of all three approaches. Before reading cognitive text-processing strategies were employed more often than after and during reading strategies. There were no statistically significant relationships between: instructional approaches and text-processing strategies, demographics and instructional approaches, and demographics and the use of text-processing strategies. Interview data showed that teachers who used high levels of scaffolding and collaboration were knowledgeable in their subject areas, freeing them to focus on learners in personal, and meaningful ways. Time was a challenge, limiting involvement in student-centred activities and collaboration with colleagues. Meeting diverse student needs required creative, flexible instruction.

This study provides teacher preparation programs and policy makers with evidence to reconsider issues associated with (a) the curriculum, (b) testing, (c) class size, (d) class make-up, (e) differentiated learning needs, and (f) professional development.

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Dedication

To Matt, Lisa, and Richard
Thanks for always being there.

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CHAPTER 1

Nature of the Study

Tensions exist between present day theoretical beliefs underlying literacy instruction and the reality of the teaching-learning context. On the one hand, social constructivist theory (Au, 1998; Roguff, Matusov, & White, 1996) suggests that learning takes place through active participation and interaction between teachers, students and their peers (Au, 1998) with the teacher both: (a) scaffolding or providing support to guarantee successful learning; and (b) arranging collaborative experiences to facilitate the ongoing construction of knowledge. In addition, investigations into content area reading instruction over the last twenty years have long since validated the effectiveness of cognitive text-processing strategy instruction to enhance the development of independent, strategic readers and thinkers (Palincsar & Brown, 1984; Roehler & Duffy, 1991).

In spite of the research validating teaching practices based on social constructivist beliefs and the value inherent in the explicit demonstration of specific comprehension strategies, current studies (Alverman & Moore, 1991; Bean, 2000; Davey, 1988; Hinchman, 1987; Langer & Applebee, 1987; O'Brien, 1988; Pressley, Wharton-McDonald, Hampston, & Echevarria, 1998; Ratekin, Simpson, Alvermann, & Dishner, 1985) indicate that the majority of middle and senior years content area teachers continue to address course content through a transmission-lecture style approach to teaching that maximizes teacher control and increases learner passivity. Even new teachers indoctrinated into the importance of social constructivist practices, including scaffolding, organizing collaborative groups, and developing text-processing strategies, seem to revert to lecture style teaching after two or three years in the field (Bean, 2000).

A student-centred approach in a collaborative learning context engages students in using the literacy tools of reading, writing, speaking, listening, viewing, representing, and critical thinking with others in a search for meaning. Classroom observation, however, reveals that only a smattering of content area teachers pursue this type of instructional practice (Alverman & Moore, 1991; Davey, 1988; Hinchman, 1987; Langer & Applebee, 1987; O'Brien, 1988; Ratekin, Simpson, Alvermann, & Dishner, 1985). The majority of teachers remain teacher-centred in their instructional approach, actively engaged in transmitting knowledge. Yet Vacca and Vacca (2002, p. 6) state that when information or content is "broadcast" by the teacher on a daily basis, students become bogged down in a mire of passive learning that stands in the way of cognitive processing and mitigates against taking ownership and responsibility for learning. Such instruction in this teacher-dominated model is characterized by teacher lectures, fill-in-the-blank worksheets and short answer questions, followed by memorization of the content for later recitation on tests.

Social constructivist theory, that forms the underpinnings of our current understanding of literacy learning, emphasizes that meaning is constructed through the dynamic interaction of both teachers and students (Au, 1998). Yet classroom opportunities to discuss and write about content-related topics are often passed over in the classroom, due in part to pressures inherent in needing to cover heavy, content-dominated curricula, as well as concerns over student success on high stakes testing. Teachers are driven to "get through" as much course content as possible, which is often accomplished by transmitting information.

The comprehension of written text requires that students actively monitor their understanding and apply text-processing strategies before, during and after reading. It is the role of the teacher to model and demonstrate specific strategies for processing different kinds of text (Roehler & Duffy, 1991) as well as to teach for transfer by helping students know when and why to use specific strategies (Brown, 1987). In reflecting on the relative absence of cognitive text-processing strategy instruction in the content areas, investigators (O'Brien, Stewart & Moje, 1995; Pressley, 2000) believe that the failure to integrate these metacognitive strategies into middle and secondary classroom instruction is largely due to a mismatch between the experimental methodology in which the text-processing strategies were studied and the classroom context.

In other words, one of the causes for failing to integrate text-processing strategies into classroom instruction relates to the failure to recognize the classroom learning environment. In analyzing how cognitive text-processing instruction was studied under experimental conditions, Alvermann and Moore (1991) concluded that the research neglected to consider the real classroom situation in that the study procedures: (a) were short term, (b) lacked connections with the regular classroom program, (c) had limited teacher input, (d) used short reading selections, and (e) failed to follow through with on-going professional development to assist teachers in providing strategy instruction to their students.

Based on their investigations, O'Brien, Stewart, & Moje (1995) concluded that teachers do in fact perceive potential value in using research-based instructional strategies, but are often unable to see connections to their own content area. In fact, the research at this point has not made definitive conclusions about the particular usefulness

of one strategy over another for specific content areas (Brown, 1994; O'Brien, Stewart, & Moje, 1995; Pressley, 2000). Some teachers are making in-roads into using particular cognitive text-processing strategies, however strategy implementation may take up an inordinate amount of time and be difficult to adapt to particular disciplines (O'Brien & Stewart, 1992; Stewart, 1990; Vacca & Vacca, 1993).

Teaching by transmission continues to occur despite evidence in the literature that social and cultural factors also play an important role in learning (Au, 1998; Wham, Lenski, & Griffey, 1999). A sociocultural approach to learning views instruction from the point of view of a "situated perspective" (O'Brien, Stewart, & Moje, 1995) that recognizes the presence of contextual factors or complexities in the teaching-learning environment that play an important role in how teaching and learning are played out in the classroom. A "situated" sociocultural context (Moore, 1996) has the potential to lead to a better understanding of instruction; specifically the challenges teachers face in implementing social constructivist practices and cognitive text-processing strategy instruction. A sociocultural view of teaching and learning creates a window to develop: (a) an understanding of the complexities and pressures faced by students and teachers because of their positioning in the school system, (b) more reflective thinking associated with the analysis of curriculum, pedagogy, and the classroom environment; as well as (c) alternative ways to incorporate a social constructivist perspective and cognitive text-processing strategies into instruction (O'Brien, Stewart, & Moje, 1995).

Summary

The ultimate goal of research in reading comprehension is to guide students to become independent, competent readers, writers, and thinkers. Essentially, this requires

that research be translated into practice that teachers are willing and able to incorporate into their classroom instruction (RAND Reading Study Group, 2002). Research over the last twenty years has provided us with instructional practices and strategies to support the processing of content area text, while social constructivist theory has deepened our understanding of the learning process. Knowledge is viewed as a process of construction rather than dissemination, with the teacher supporting student learning and using collaborative groups to negotiate meaning. Yet both social constructivist practices and cognitive text-processing strategy instruction remain strikingly absent from the practices of large numbers of content area teachers (Brown, 1994; O'Brien, Stewart, & Moje, 1995; Pressley, 2000). Descriptions of the classroom context have been missing from earlier accounts of the effectiveness of instruction in cognitive text-processing, scaffolded teacher instruction, and the use of collaborative learning groups.

Theoretical Perspectives

Epistemological Beliefs Related to Pedagogical Practices

Epistemological beliefs, or how one views knowledge, its nature and how we come to know (Murphy, 1997), are inextricably linked to how we perceive what constitutes learning (Ernst, 1995). In fact, discussions about the connection between epistemology and learning have been taking place for thousands of years, even as far back as Socrates and questioning techniques to enhance critical thinking (von Glaserfeld, 1987 cited in Murphy, 1997). Educational practice, or how a teacher instructs students, is guided by how the teacher perceives both what constitutes knowledge and the process involved in coming to know or becoming knowledgeable about content. A teacher's theoretical perspective determines the instructional practices that are used to teach subject

area content, and may be represented at either end of a continuum by a transmission model, on the one hand, or a social constructivist on the other.

Transmission or teacher-dominated model. Historically, content area instruction has been guided by a positivist view of knowledge based on the belief that knowledge is a fixed quantity of information that can be acquired by listening to someone more knowledgeable. If one believes that learners passively receive information, then the instructional focus will be on the transmission of knowledge. The teacher, as the expert, presents information and devises tests so that students are able to demonstrate their knowledge. At the same time, teachers act as managers overseeing students' work (Rogoff, Matusov, & White, 1996). Knowledge is viewed as an objective reality based on the world outside of oneself. It is viewed as something to be acquired in an isolated fashion apart from social interaction with others.

Based on this view of knowledge as a fixed quantity, most curricula of middle and senior content area subjects have been built on the assumption that knowledge can be objectified and disseminated into compartmentalized separate disciplines (O'Brien, Stewart, & Moje, 1995). From this perspective, curriculum is viewed as a predetermined source of knowledge, with a required textbook and specific readings controlling what is deemed to be legitimate. This, in turn, restricts the way in which knowledge is taught, presented, and discussed (Apple, 1988, 1993; Apple & Christian-Smith, 1991; Giroux, 1988).

The view that knowledge is a fixed quantity, that typifies a traditional behaviourist perspective, influences both teaching and learning and defines the roles of teacher and student. The learner's role, from a behaviourist perspective, is to acquire

knowledge of the world as transmitted by the teacher, who plays a mechanistic function in the transfer of knowledge (von Glaserfeld, 1995). The teacher is at the center of instruction, dispensing information and orchestrating knowledge acquisition while the learner attends lectures, completes assignments involving the transfer of textual information in response to teacher-composed questions, and memorizes notes for subsequent recitation. Learning is, therefore, the result of environmental contingencies (Alexander & Fox, 2004). Most of the literature (Alverman & Moore, 1991; Bean, 2000; Davey, 1988; Hinchman, 1987; Langer & Applebee, 1987; O'Brien, 1988; Ratekin, Simpson, Alvermann, & Dishner, 1985) suggests that this behaviouristic, transmission-based instructional model drives the pedagogical practices of the majority of content area teachers.

Teaching practices are further influenced by: (a) teacher affiliations and loyalties that are tied deeply to their disciplines (O'Brien, Stewart, & Moje, 1995), (b) the values and beliefs teachers have developed from a variety of life experiences, and (c) the theoretical background that was prominent at the time of their teacher education program (Wham, Lenski & Griffey, 1999). At the opposite end of the continuum from transmission lies a social constructivist point of view of teaching and learning.

Social constructivist theory. Social constructivist theory provides new insights into teaching and learning, placing students at the centre of their own learning. While Fosnot (1996) cautions that social constructivism is a theory about learning, and not a description of teaching that can be directly and succinctly translated into a set of instructional practices, the thrust of social constructivism is on the *construction* of knowledge through interactions with others. A constructivist model of teaching and

learning stands as the antithesis of a transmission model in which knowledge is viewed as being passed on by the act of hearing it. *Social* refers to participation as a member in a community where self and social reflection are practiced. Learners collaborate, negotiate and participate as members of a learning team. This community of learners shares its understandings and thinking, and evaluates divergent points of view, both individually and as members of a group (Rogoff, Matusov, & White, 1996).

Rather than viewing the role of the teacher as being a transmitter of knowledge, social constructivist theorists focus on the experiences and the multidimensional views of both teachers and learners as they construct meaning together, supported by texts and multiple and diverse media (Au, 1998). If one perceives, as social constructivists do, that in order to make sense of our world learners actively construct knowledge as they seek understanding, then teaching will focus on developing meaning. Unlike those with a traditionalist viewpoint, constructivists do not adhere to the belief that knowledge exists outside oneself and needs only to be revealed. Glasersfeld (1987) contends that knowledge is not simply transferable and that telling is not the most effective mode of conveyance. Instead, constructivists believe that learning requires the active participation of individuals who, given a particular text and particular issues to think about, discuss what they understand, and through their personal experiences and beliefs, together build understanding. It is evident, therefore, that to understand a concept and to make learning our own, we must: (a) process the information through the application of cognitive strategies, and (b) experience the text content in some personal way. The way we teach is thus influenced by our understanding of the learning process that has undergone a

theoretical shift from a behaviourist to a cognitivist to a social constructivist stance (Geoffrey & Anderson, 2000; Jetton & Alexander, 1998).

Social constructivist theories of learning provide a framework for viewing literacy as the vehicle from which meaning and understanding are constructed and constituted (Cook-Gumperz, 1986). Through literacy acts, people engage in communication with the text and others to come to an understanding both individually and as a community of learners. Every literacy act is of a social nature, even if interacting with the author's words alone, since the text itself is constructed by the author and from all the past interactions s/he has experienced.

Readence, Bean, and Baldwin (1998, p.4) define content area literacy in their co-authored textbook as, "The level of reading and writing skill necessary to read, comprehend, and react to appropriate instructional materials in a given subject area." Of significance is the active role that the learner plays in using literacy skills to construct understanding. The content of specific disciplines is not viewed as an entity in itself. Knowledge acquisition is believed to be embedded within literacy, and so the ability to read with understanding is paramount to creative and critical thinking and learning. Thus, text in its broadest sense refers to printed material in books, articles, newspapers, media and the computer screen, as well as to talk; these are, in effect, the vehicles around which social constructivists begin their dialogue.

It is acknowledged, however, that a teacher's approach to instruction may not clearly be one approach or the other. Instruction may be dominated by a transmission or a social constructivist approach or may follow a combination of these approaches, as is discussed in the next section.

Instructional Practices Between the Dichotomies

The reality of classroom practice is that instruction may not be easily dichotomized into one approach or the other; in other words neither a purely transmission nor a purely social constructivist approach holds sway in most classrooms. Straw (2002), for example, envisions instructional practice in terms of a continuum that incorporates both high and low levels of teacher scaffolding and collaborative learning groups. This classification system results in the conceptualization of four quadrants: low scaffolding-low collaboration, high scaffolding-low collaboration, low scaffolding-high collaboration, and high scaffolding-high collaboration, as illustrated in the accompanying diagram (Figure 1.1) adapted from Straw (2002).

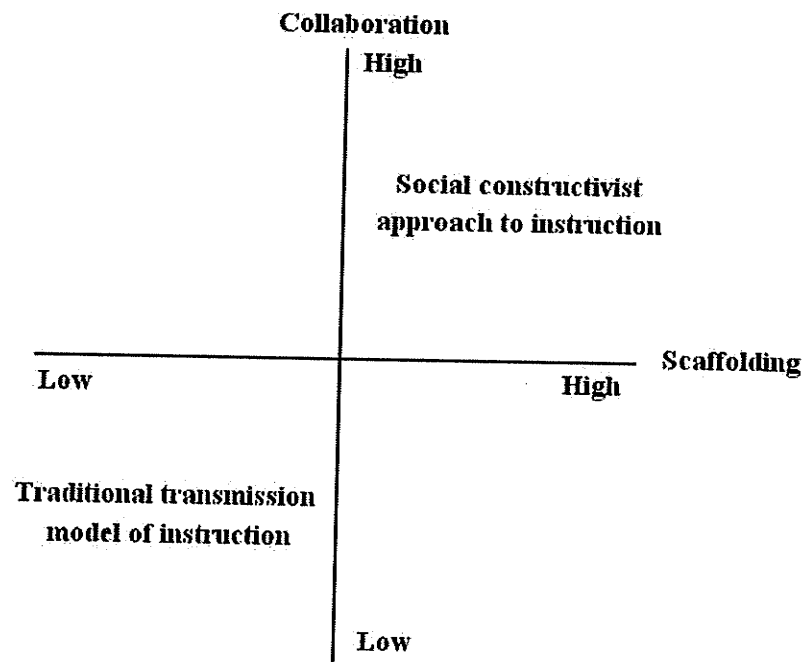


Figure 1.1. Conceptualization of instructional approaches (Straw, 2002).

In the low scaffolding-low collaboration quadrant, representing a traditional transmission model, teacher-talk dominates. The teacher lectures or dictates notes, and

there is an absence of explicit instruction and scaffolding. In the high scaffolding-low collaboration quadrant, the teacher provides explicit cognitive strategy instruction with students working independently. In the low scaffolding-high collaboration quadrant, there is an absence of strategy instruction. Students collaborate in small groups with a minimum of teacher input. Finally, in the high collaboration-high scaffolding quadrant, that characterizes a social constructivist approach, the teacher offers scaffolded strategy instruction and students work together collaboratively until they understand and learn the subject matter. Still, these classification quadrants may not be so mutually exclusive in real classroom practice. Approaches to instruction may be more eclectic.

Current Theory of Pedagogy: An Evolution of Instructional Practices

The evolution of our understanding of the learning process began with behaviourist notions, progressed to an understanding of the role of cognition and finally to the realization that we learn through social interaction. These three stances, as well as the teaching practices that emanate from them, can be traced back to their epistemological roots. Rather than considering these learning theories as separate, with one replacing the other, we need to revisit the cognitive processing model in light of social constructivism. That is, the social constructivist view provides another dimension to readdress the cognitive viewpoint, specifically, cognitive text-processing.

Vygotsky (1978), whose work initiated our understanding of social constructivism, states: "All higher level cognitive processes arise out of social experience. Each intellectual function a person acquires... must appear two times: first at a social external level between individuals, and then at a personal, internal level within an individual" (p.163).

According to Block and Pressley (2003), in order to operationalize Vygotskian views that incorporate both cognitive and social dimensions, there must be two levels of instruction: the modelling and explanation of comprehension processes to guarantee that students acquire a repertoire of cognitive text-processing strategies, and scaffolding to support student learning in collaborative groups that lead to the independent application of strategies. Gee captures these notions by distinguishing between three phases of teaching, the first of which is “acquisition” that begins by providing a meaningful context; the second, that involves building strategy awareness or “conscious knowledge” regarding how to process text; and the third, that relates to teaching “meta-knowledge” or knowledge about strategy application—when and why to apply strategies (1987, p.9). Once acquired, these phases, he believes, capture the process of helping students become truly literate.

Summary

Although literacy researchers have provided us with a wealth of information about text-processing strategies and social constructivist practices to enhance student learning, and although this information is widely available in professional journals and through teacher in-servicing, according to the literature the instruction of a preponderance of middle and secondary school teachers continues to be governed by a transmission model of instruction. The status quo continues in the majority of classrooms, despite theory and research which suggests that students benefit from cognitive text-processing instruction in social constructivist classrooms. One of the major purposes of this study, therefore, is to identify the challenges teachers face in following a social constructivist

approach to instruction and in providing direct, explicit instruction in cognitive text-processing strategies to facilitate learning in content area subjects.

Significance of the Study

This is an exploratory study to investigate the issues teachers face in following theoretically-driven and research-based literacy practices, and to develop demographics on the instructional practices of content area teachers in the middle and senior years. The research seeks to uncover the effect that factors such as level of education, year of graduation, years of teaching experience, gender, age, subject area, years teaching a subject, school location, number of students in a school, and number of teachers teaching the same subject in a school have on the implementation of practices emanating from current theory and research in terms of cognitive text processing and social constructivism. This part of the study used a quantitative design. As a follow-up, the qualitative, constant comparative method of grounded theory inquiry (Glaser & Strauss, 1967) was employed to discover the challenges teachers face in integrating cognitive text-processing and social constructivism into content area instruction in today's teaching-learning environment and the socio-cultural factors that influence teacher decision-making.

The projected findings will add insight into the implementation of constructivist approaches and cognitive text-processing by: contributing to a better understanding of the kinds of instructional and situational influences that middle and senior years teachers encounter as they support student learning, and uncovering the specific tensions that teachers in the field experience as a result of provincial, school division, and school-site administrative policies.

In summary, by using quantitative methods, this research will identify (a) the predominant approach to instruction used by middle and senior years, (b) the use of before, during and after reading cognitive text-processing strategies and (c) the relationship between instructional approach and cognitive text-processing strategies and between each of these variables and demographics. The qualitative data gathered through teacher interviews will reveal the challenges and concerns that impact instructional decision-making. Findings will provide teacher preparation programs as well as policy makers with evidence to reconsider the positive or negative influences associated with (a) the current curriculum, (b) testing, (c) class size, (d) class make-up, (e) differentiated learning needs, and (f) support for teachers in implementing new instructional strategies.

Questions for Study

Based on questionnaire data, the questions included:

1. What are the characteristics of the teachers who participated in this study in terms of a demographic profile?
2. What is the most predominant approach to instruction used by middle and senior years teachers in this sample? Do teachers in this jurisdiction use mainly a transmission or lecture approach, a scaffolded or a collaborative approach to instruction?
3. What are the five most frequently used instructional approaches used by middle and senior years teachers in this study?
4. What is the nature of use of the cognitive text-processing strategies (before, during, after reading) that teachers use?
5. Are there statistically significant differences in the frequency of use of cognitive

text-processing strategies before, during or after reading?

6. Is there any relationship between predominant approach to instruction and the use of cognitive text-processing strategies before, during, and after reading?
7. Are there differences between content area teachers according to instructional stance (transmission approach, scaffolded instruction, use of collaborative learning groups or a combination of scaffolded instruction and collaborative learning groups) and such demographics as (a) level of education, (b) year of graduation (c) years of teaching experience, (d) gender, (e) age, (f) subject areas taught, (g) years teaching a subject, (h) number of teachers teaching the subject in the same school, (i) school size, and (j) school location?
8. Are there differences between content area teachers according to the use of cognitive text-processing strategies and demographics, including (a) level of education, (b) year of graduation (c) years of teaching experience, (d) gender, (e) age, (f) subject areas taught, (g) years teaching a subject, (h) number of teachers teaching the subject in the same school, (i) school size, and (j) school location.

Based on interview data, the questions included:

9. Are there common, shared characteristics between teachers who use social constructivist approaches in their teaching?
10. What do the instructional programs of teachers using social constructivist practices look like?
11. What do content area teachers perceive as their concerns and challenges?
12. Is there sufficient support from the division and school level to fulfill teachers' professional development needs?

13. How do teachers perceive their workplace environment in terms of curricula, timetabling, class size, and composition?
14. What do teachers know about their adolescent students that informs their instruction?

The terms used in this study are defined in the following section.

Explanation of Terms

Adolescent literacy. A term used to address the distinctive and multiple dimensions of the reading and writing of young people that moves beyond school-based literacy activities and incorporates expanded notions of text (film, CD-ROM, the Internet, popular music, television, magazines and newspapers).

Best practices. Within the social constructivist approach, best practices are defined in this paper as theoretical- and research-based principles that provide a foundation for instruction to support the reading development of all learners (Mazzoni & Gambrell, 2003).

Cognitive perspective. Learners are actively engaged in constructing meaning by interpreting and making sense of their world based on what they already know and what they construct or reconstruct as they participate in new experiences or acquire new information (Dillon, 2000, p.3).

Cognitive text-processing. The deliberate and conscious application of comprehension strategies to facilitate the construction of meaning while reading content area text. These comprehension strategies are applied before, during, and after reading. Strategies include the following: previewing, self-questioning, making connections,

visualizing, knowing how words work, monitoring, summarizing, and evaluating (McLaughlin & Allen, 2002, p.9).

An example of a before reading text-processing strategy is an advance organizer defined by Jones, Tinzmann, Friedman, & Walker (1987) as a way of presenting information before reading a text to assist in organizing ideas. Advance organizers provide an overview of the content to be studied serving in this way as a framework for comprehension (IRA, 1988). An example of a during reading strategy is reciprocal teaching (Palinscar & Brown, 1984) which is defined as a cooperative paragraph by paragraph discussion activity to support metacognition by teaching students the value of questioning, clarifying, summarizing, and predicting what might come next (Unrau, 2004; Zwiers, 2004). Two after reading strategies are the jigsaw (Aronson, 1978) and the fishbowl technique. The jigsaw develops the ability to summarize understanding of a text in order to communicate the message to others. Student groups become experts on a selection of text, and then form new groups each with a representative expert on a different text and communicate their understanding to each other (Zwiers, 2004). The fishbowl strategy consists of a group of students observing an activity in which up to eight students are seated in the center of the classroom. The students in the inner circle are involved in a discussion of a piece of literature that they have read. Meanwhile, the students seated outside this circle, observe and listen to the comments and verbal exchanges of the inner circle. Following the discussion, the students in the outer circle offer feedback, such as summarizing points made by the inner group, expressing interest in specific comments and ideas, and asking for any needed clarification (New Jersey Language Arts Literacy Curriculum Framework, 1998).

Content area reading. This term relates to the materials, traditionally content area textbooks, that students encounter as they study such subjects as science and social studies. These materials usually require advanced levels of literacy processing skill (Moje, Young, Readance, & Moore, 2002; Readance, Bean, & Baldwin, 1998).

Fair and equitable assessment. An accountability policy in which courses of the same subject and the same grade follow the same content and implement identical tests and exams across the school division.

Metacognitive abilities. This involves “one’s knowledge concerning one’s cognitive processes” [and] “the active monitoring and consequent regulation of these processes” (Flavell, 1976, p.232). In other words, metacognition includes both knowledge of strategies to assist in obtaining meaning from text and the control over these processes to support further comprehension and learning when working independently.

Middle years. Refers to students in grades 5 to 8 who are approaching adolescence and in transition between elementary and secondary school.

Scaffolded instruction. In this study, scaffolded instruction was characterized by teachers interacting with students to support successful task completion, accepting responses that were partially correct; and using such organizational frameworks as semantic maps.

Secondary years. Refers to adolescent students in grades 9 to 12 (Senior 1 to 4).

Situated perspective. According to Smith-Burke (1989, p.13), literacy skills (reading, writing, speaking, listening, viewing, representing and critical thinking) are not viewed simply as tasks to be performed, “but are enmeshed in cultural and social webs,

values, attitudes, and beliefs” that are in the school environment and have often been overlooked by research conducted in the empirical-experimental mode.

Social constructivism. A theory of learning that places students at the centre of their learning. Knowledge is constructed through interactions with others. Learners collaborate, negotiate, and participate as members of a learning team. As a community, learners work together contributing their understanding, thinking, and considering different points of view (Rogoff, Matusov, & White, 1996).

Text. In contrast to the traditional concept of text as being related to books and magazines read in linear fashion (Wade & Moje, 2000), the range of material encompassed in the definition of text used in this study included not only traditional books, but also media and the computer screen, often read in a nonlinear fashion. Text can also include classroom discourse that also plays a role in subject matter learning (Jetton & Alexander, 1998).

Traditional behaviourist model (Transmission approach to instruction). Underlies teaching practices that predate the notion of literacy as a meaning-making process. The teacher assigns text for students to read, and then through teacher developed questions or lectures *tells* the students what the text is about by explaining the ideas and information (Vacca & Vacca, 2002, p.6). Teacher scaffolding of student learning and collaborative learning groups are not a part of this instructional approach.

CHAPTER 2

Review of the Literature

Reading development takes place along a continuum that starts in early childhood and extends throughout the adolescent years, with the needs of primary, elementary, and adolescent students being quite different from one another (Alexander, 2003). By the time students have completed their primary and elementary schooling, they have acquired a great deal of information about reading and writing. There is, however, much more knowledge to be acquired in order to become a sophisticated adult language user. Adolescent literacy development requires the same attention and respect given to beginning reading (Moore, Bean, Birdyshaw and Rycik, 1999), in part because the literacy demands on adults of the future are expanding. Accordingly, adolescent readers must be prepared to carry out a wide range of literacy tasks across time, domains, and contexts including more reading and writing than at any other time in history.

A Crisis in Adolescent Literacy

Research by the National Assessment of Educational Progress (NAEP, 1998) reveals that the literacy challenges facing both middle and senior years students across different academic domains are not being met by currently offered instructional programs. Subject area instruction typically focuses on content rather than the learning process. NAEP found that while approximately 60% of American adolescents were able to comprehend textual information that was factual, few of the students in their assessment had advanced to more complex reading and writing achievement levels. Less than 5% of the students in their assessment could extend or elaborate their thinking

beyond the printed text. In the writing assessment, only a small number of students could provide supportive detail that developed the main idea further.

The process of learning to become accomplished in the use of all the literacy skills that support thinking--reading, writing, listening, speaking, viewing, and representing, occurs in developmental stages. This means that the early knowledge and application of these strategies is critical to further literacy development. Additionally, competence builds over time. Early success does not preclude the need to hone literacy skills in the adolescent years. In other words, literacy development is not the territorial domain or sole responsibility of the primary or elementary teacher. Nor is it restricted to learning a set of discrete skills and responding aesthetically to literature (Alexander, 2003). It is at the middle and secondary school level that complex and intricate literacy skills are refined to meet the increasing demands of being an adolescent in a literate society--to speak convincingly, to think and reflect, and to acquire lifetime skills.

According to the RAND Reading Study Group (Snow, 2001), the goal of reading instruction is to develop proficient adult readers who are able to "read a variety of materials with ease and interest, ...read for varying purposes, and ... read with comprehension even when the material is neither easy to understand nor intrinsically interesting" (p. xiii). The development of advanced literacy knowledge during the adolescent years requires the guidance of knowledgeable teachers. Moore, Bean, Birdyshaw and Rycik (1999) contend that teachers working with youth at upper levels need to be aware of and provide supportive instruction to help students: (1) increase fluency, (2) adjust speed to purpose, (3) discern the characteristics of different kinds of fiction and non-fiction, (4) cultivate reading preferences, (5) refine responses to literature,

and (6) apply previously learned reading strategies to make sense of more complex and abstract subject matter that lies outside the realm of personal experience.

In 1999, Carol Santa, then president of the International Reading Association (IRA), declared that adolescent literacy was in an "ever deepening crises" (Moore, Bean, Birdyshaw & Rycik, 1999) and contended that the literacy needs of adolescents were being overlooked. While both government and the public are aware of and support literacy development in the early years (Kindergarten to Grade 3), and in particular early intervention, the literacy needs of the adolescent go unnoticed. Media interest in adolescent literacy is negligible. Further, adolescent literacy lacks the attention of policy-makers, including those involved at both divisional and local school levels.

In response to Santa's statement, a Commission on Adolescent Literacy was formed within the International Reading Association, and a position statement approved in May 1999. The position statement (Moore, Bean, Birdyshaw, & Rycik, 1999) reinforced the idea that adolescents deserve: (1) access to a wide variety of reading material; (2) instruction that builds both the skill and desire to read increasingly complex materials; (3) assessment that identifies their strengths as well as their needs, and guides further instruction; (4) expert teachers who model and provide explicit instruction in both reading comprehension and the study strategies; (5) reading specialists who assist students experiencing difficulty; (6) teachers who understand the complexities of individual adolescent readers, respect their differences, and respond to their characteristics; and (7) homes, communities, and a nation that supports their efforts to achieve advanced levels of literacy and provides the necessary support. Santa considers that the horrific massacre at Columbine High School in Colorado, which coincided with

the Commission's work, highlighted the need to address the serious societal problems of adolescents.

Spurred on by this event, in 1999 the United States Office of Educational Research and Improvement Department of Education requested that the Rand Reading Study Group (RRSG) develop a research agenda to address the most pressing literacy issues. This group recommended that reading comprehension in the middle and senior years be the focus of their research. A number of factors precipitated this decision including the following facts: (1) high school graduates of the 21st century require a high level of literacy proficiency, among them the ability to comprehend complex texts; (2) compared to other countries, American students in the upper grades perform poorly in content-related subjects; (3) gaps in reading performance persist between different demographic groups despite efforts to address the problem; (4) best practices in content area literacy instruction require further investigation, teachers not having been provided with: effective evidence-based instructional strategies on ways to enhance reading comprehension; ways to advance content area learning through the reading of informative text; or ways to meet the needs of learners with varying comprehension skills; and (5) policies and programs directed at improving reading comprehension, including state mandated student testing, teacher accreditation, and the empirical evaluation of approaches to intervention. These issues are also relevant in Canada where education is the responsibility of the provincial governments with relatively limited federal support.

In the International Reading Association's seventh annual literacy education survey of twenty-five experts representing teachers, school administrators, and professors in higher education from the United States, Canada, and outside of North America

(Cassidy & Cassidy, 2003), adolescent literacy was rated as a “hot topic” by 50% of respondents, followed by unanimous agreement that adolescent literacy should be considered an “extremely hot topic”.

In short, the literacy demands on 21st century adults will entail more reading and writing than any other time in human history (Moore, Bean, Birdyshaw, & Rycik, 1999). More sophisticated literacy skills are required to be effective in the work force, in managing a home, in becoming a responsible citizen, and in conducting ones’ life. Complex literacy skills are needed to cope with the flood of information available in our technological world where times are constantly changing. Literacy skills are necessary to fuel the creativity necessary to solve unparalleled problems.

Furthermore, with an increasingly multiethnic population, the diversity of our society continues to grow. Teachers will encounter more and more disparity in classroom makeup. Adolescents with different languages, and different backgrounds and experiences will contribute to wide ranges in academic ability, even within individual classrooms. Teachers must provide differential instruction to help cope with this diversity. There are thus not only cognitive demands on students, but also socio-cultural forces that influence adolescent literacy learning and instruction that teachers must consider. Knowledge may “reside in the context itself rather than in the individual learners” (Alexander & Fox, 2004, p. 49).

Student Diversity

As suggested, from a socio-cultural perspective, multiple literacies and discourses operate within the context of each classroom. These influence how each student learns both individually and as a group. Reading, writing, speaking, and listening are embedded

within cultural practices and as such are distinctly related to a set of norms, values, identities and how a particular group uses language and literacy (Gee, 2000). In other words, students will use and understand language according to the different discourse groups that have been and are part of their life experience, including the current pop culture that may override academic values.

Among the many cultural influences that impact on adolescent student learning are family, community, ethnic, school, classroom, teen, and many other subcultures (Unrau, 2004). Students may be out of tune with academic expectations because they may be coping with disparities between the culture of their heritage and the prevailing North American culture, parental indifference, and pressure from the cultural group to which they belong that shares the same values, attitudes and perspectives on life. Unrau emphasizes that the issue of how culture shapes experience is not trivial for educators.

Confounding these issues is the reality that teachers, too, are part of a cultural group and interpret student behaviour through their own cultural subjectivity. On the one hand teachers feel pressured to cover the mandated curriculum, and on the other are faced with learner resistance. Coping with classroom diversity becomes a challenge.

This challenge, to develop instructional programs that take into account the complex and diverse needs of students from varying backgrounds within the context of a single classroom, becomes readily apparent by studying the accompanying Figure 2.1 (Sweet & Snow, 2002) which places literacy learning within a sociocultural perspective. Each of these elements is considered separately in the following discussion, but the broad sociocultural context that is highlighted in the concentric circle, affects the nature of the interactions between and among them.

The reader. In order to comprehend and remember text, the reader must have a wide array of abilities. These include: cognitive ability, critical analytic ability, the ability to concentrate and remember, as well as the ability to visualize and make inferences, and understand different types of knowledge (vocabulary, domain and topic knowledge, as well as linguistic and discourse knowledge). Other learner attributes include purpose, interest, and motivation. While all of these abilities influence comprehension and memory, student learning is also influenced by the responses of classmates evident in classroom discourse, the activity in which they are engaged and the text.

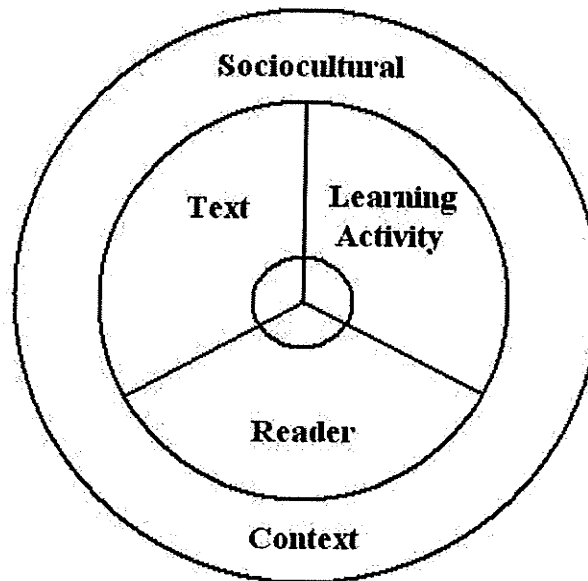


Figure 2.1. Reading within a sociocultural perspective (Adapted from Sweet & Snow, 2002, p.24).

The text. The concept of text carries a much broader connotation than previously, extending beyond textbooks to include many forms of print literacies including newspapers, magazines, brochures, flyers, and newsletters, electronic texts, and multimedia documents. Text also includes talk, the discourse that transpires when topics

are discussed which becomes a text in itself. The sociocultural background of the classroom also influences this text. As indicated, comprehension is affected as well by the relationship between the text and the range of reader knowledge and abilities.

Comprehension will also be influenced by the learning activities structured by the teacher to help students process the information. Depending upon the sociocultural make-up of the students, their attitude, strengths and interests, some activities are more appropriate than others. The teacher is further challenged by the current expectations that *all* students will be able to read increasing amounts of text at more complex levels.

Learning activity. Each classroom activity has a purpose that further defines both how the activity should be carried out, including individually or as a group, the time allotted, the working guidelines and supports, as well as the expected outcomes and grading criteria. The reason for engaging in the activity is either intrinsically driven by the student or extrinsically determined by the teacher. Problematic to externally driven purposes is the possible lack of compliance or “buy-in” from the students. Accordingly, the sociocultural context also plays a significant role in teaching and learning.

Sociocultural context. In addition to the nature and content of the material, the topic and the learning activity, the social interactions among teacher and students also contribute to learning in profound ways, the discourse community in each classroom being unique. Differences between the classroom discourse community (teacher expectations and student-student and teacher-student dynamics), the social, cultural, language and literacy practices of each student influence the learning that takes place.

Semiotic Domains and Student Success

James Gee (2001) adds to our understanding of the sociocultural context that influences language and literacy learning. With a linguist's background, Gee speaks in terms of semiotic domains, the discourse groups in which members have particular ways of thinking, talking and interacting with one another. Throughout our lifetime, according to Gee (2001) and D'Andrade and Strauss (1992), we are socialized into a number of Discourse groups (signified by a capital "D") (Gee, 1999a). These serve as cultural models and are value-laden, providing us with guidelines to know what is appropriate and inappropriate as members of that particular Discourse.

In schools, students are expected to read and write in a variety of these Discourses, using for example, the language of the mathematician, the historian, the geographer, the health care worker, and the academic. School success means the ability, at the very least, to recognize these varying Discourse groups and their social languages and, more importantly, to assume a particular identity through reading and writing in that social language. The school, with changeable content area groups becomes a Discourse community in its own right.

With this in mind, Gee places learners along a continuum, from the disadvantaged whose life experiences offer little exposure to the ideas, values, and ways of thinking that are part of academia on the one end, and on the other to the more advantaged, whose background, values and experiences closely match the culture of schooling. Gee (2001) believes that disadvantaged students who lack the semiotic background that presides in the context of the school can change the course of events by choosing to master the school-based domain. The "entry price" into this new domain nonetheless requires

personal commitment and total dedication of body and mind in terms of the desire to belong to the, perhaps new and different, affinity group. Another factor influencing whether a learner is able and willing to pay the entry price and enter successfully into the school domain is the influence of other people, including classroom teachers.

Gee (2001) contends that it is necessary to empower those individuals whose life experiences are not prototypical of the kind of school based literacy practices experienced in classrooms. From this sociocognitive viewpoint, teachers must make student-student and student-teacher discussion a valued part of the learning experience in every school subject and provide substantive support for language development not only in terms of reading and writing, but also in terms of listening, speaking, viewing, and representing. Gee (2001) argues further that language is most appropriately used in terms of two functions: (1) to guide or direct the action of others; and (2) to guide individual connections to different cultural, social, and institutional ways of thinking, feeling, acting, and talking through experiences so that individuals take on certain perspectives.

Language has traditionally been viewed as a *closed system* (Clancey, 1997 in Gee, 2001), in that the comprehension of what is read or heard has been thought of as a process of translating the message into one's own words or into an "internal mental language" that closely resembles language and is a representation of the message that was heard or read. Situated cognitive studies (Baralou, 1999a, 1999b; Brown, Collins, & Dugid, 1989; Gee, 2001) have led sociocognitivists to view meaning derived from language not only as some kind of verbal language proposition but as an experiential phenomena complete with perceptions, feelings, actions, and interactions, that are stored in the brain as dynamic images linked to our perceptions of the world and our internal

states and feelings. This profound insight into the role of language in learning suggests that learning is more than a process of explaining information, and not simply the process of sending and receiving information and rewording or paraphrasing the ideas expressed in a lecture or read in a textbook. Learning is a process of drawing on old experiences to help make connections with new experiences. By hearing other viewpoints and how they are expressed through certain words and grammar, students can imitate and internalize different communicative intentions (Tomasello, 1999).

The way in which we use language, then, is a reflection of the way in which we understand and react to the world. Classroom social interactions are a way of expanding learning and developing clearer world-views. Freire (1995 as cited in Gee, 2001) states the implications of language and its role in interacting with the world this way: "Reading the word and reading the world are, at a deep level, integrally connected – indeed, at a deep level, they are one and the same" (p. 717). These new insights lead to a discussion of the historical context of teaching and learning.

Trends from the Past to the Present--Models of Instruction, Theory, and Practice
Traditional Transmission Model

The earliest experiences in public school learning were guided by the theory that knowledge was transferable from one person to another. Knowledge was viewed as a commodity that could be conveyed from the knowledgeable individual, the teacher, to the student simply by listening, the assumption being that a direct conduit existed between the talker and the listener, and through the act of listening the exact replication of knowledge could be implanted into the minds of students (Bainbridge & Malicky, 2004).

Along with this behaviouristic notion of knowledge transmission, teaching and learning were measured in terms of quantity or the number of facts stated by the teacher and reproduced later by the student on demand, usually through testing. Instructional practices relied heavily on the lecture format to convey information to students. Essentially, teachers imparted knowledge to their students and then measured student understanding of the content by testing their recall of the information. Poor test performance was a sign of a student's poor listening ability or inattentiveness.

Observations of content area classrooms made over the past decade reveal that while some progress has been made, the majority of middle and senior years classrooms remain largely unchanged. A transmission model of teaching and learning predominates (Alverman & Moore, 1991; Davey, 1988; Hinchman, 1987; Langer & Applebee, 1987; O'Brien, 1988; Ratekin, Simpson, Alvermann, & Dishner, 1985). Content area instruction continues to consist mainly of teacher talk and lectures, textbook assignments, and the memorization of information for later recitation (Goodlad, 1984; Vacca & Vacca, 2002). Further, in classrooms where the transmission model of teaching and learning drives instruction, the following characteristics prevail: (1) all decisions regarding learning tasks are decided by the teacher, (2) student learning, progress, and evaluation are the teacher's responsibility, (3) knowledge, skills, and attitudes are taught and assessed as separate entities by the teacher, (4) teacher talk predominates throughout the day, (5) learning follows a linear path in incremental stages, and (6) mastery is reflected in responses to questions, completed worksheets, and test performance (Bainbridge & Malicky, 2004). This type of instruction is referred to as being teacher-centered; the teacher being the most active participant in the learning experience. The student is placed

in a passive role that essentially inhibits ownership and learning responsibility (Vacca & Vacca, 2002).

Cognitivist Paradigm

In the 1970's and 1980's a paradigmatic shift occurred in adolescent reading from a focus on instruction in the study skills to an emphasis on the role of cognition and metacognition in learning. This shift resulted when researchers in the disciplines of cognitive and instructional psychology, psycholinguistics, and sociolinguistics began to investigate reading comprehension from the perspective of their disciplines. The result of this multidisciplinary approach led to unprecedented advances in reading theory and model building to help explain learning and the comprehension process.

Underlying this shift from a behaviourist transmission model of instruction to a cognitive paradigm was the belief that learners were not passive recipients of information but were actively engaged in thinking during learning. Learners were placed at the centre of the learning experience with teachers facilitating learning rather than dispensing knowledge. Through the perspective of cognitive psychology, the learner was seen as instrumental in contributing to his or her own learning success.

During the first part of this paradigm shift in the 1970's, research from the other disciplines revealed that reading was a process involving the thoughtful selection and application of strategies (Pearson & Stephens, 1994). Comprehension was enhanced if readers varied their reading strategies not only before, but also during and after reading, with the application of specific metacognitive strategies applied at each stage (Tierney & Cunningham, 1984). On the basis of these revelations, reading comprehension strategy instruction evolved into helping direct students at each stage of the process, before,

during, and after reading. The purpose of teaching a variety of comprehension strategies, which came to be known as cognitive text-processing strategies, was to provide students with a range of learning tactics that would eventually become self-regulated.

This re-conceptualization of the learning process from viewing the learner as a passive receiver of knowledge to viewing the learner as an active participant changed the respective roles of both students and teachers. In order to process and actually learn, learners needed to move from lower cognitive levels involving memorizing and repeating factual information to higher levels, connecting new information with what they already knew, analysing and evaluating, and becoming much more actively involved in making strategic choices to enhance their own learning. From a cognitive perspective, then, learning became a shared responsibility, with teachers becoming much more active in helping students become metacognitively aware. The teachers' role moved from simply lecturing to one in which they were modelling, demonstrating, thinking aloud and explaining strategies to enhance learning and remembering. The students' role was to practice the metacognitive strategies until they could choose those appropriate to the situation and automatically apply them as tools for regulating their own learning. This instructional model fostered what Pearson and Gallagher (1983) termed "the gradual release of responsibility".

Later research on schema theory, text structure, and metacognition further developed our understanding of the reading comprehension process and enhanced our knowledge of instruction in content area reading. Reading research continues to be anchored in theories of cognitive learning.

Instructional strategies. According to Duke and Pearson (2002), metacognitively aware readers: have clear goals before they begin to read; evaluate whether the text is appropriate for their purpose; preview the complete text, noting headings and subheadings; predict content; read selectively, either omitting sections, proceeding quickly and carefully, or re-reading. As they read, good readers also: monitor their comprehension, construct, revise and question the author's intent; determine the meaning of unfamiliar words and concepts and deal with inconsistencies; draw from, compare and integrate textual information with their prior knowledge; identify the author's organizational pattern, beliefs, and the historical milieu in which the text was written; evaluate the quality and value of the text; react to the text both intellectually and emotionally; read different kinds of text differently--reducing the text to its gist and creating and revising summaries when the selection is informative, and attending to settings and characters when the text is narrative. Successful students also find reading satisfying and productive.

Among the research-supported instructional strategies identified by Duke and Pearson (2002) that are based on cognitive processing theories and foster sophisticated reading are such *before reading activities* as making predictions and asking questions, based on the notion that the comprehension process involves building bridges between the new and the known (Anderson & Pearson, 1984); such *during reading activities* as engaging in think-alouds--first modeled by the teacher, and attending to the text structure or the author's organizational framework that differs depending on whether the text is narrative or informative; and such *after reading activities* as constructing a visual representation of the text—flowcharts, semantic maps, and summaries, for example. The

visual representations and summaries serve as overviews that can be used for studying the information.

Some instructional routines combine before, during and after reading strategies. These include reciprocal teaching (Palinscar, 1982), transactional strategy instruction that uses the acronym SAIL (students achieving independent reading) developed by Pressley, Almasi, Schuder, Bergman, Hite, and El-Dinary (1994), and questioning the author (Beck, McKeown, Saandora, & Worthy, 1996). A common thread that runs through cognitive text processing instruction is that to ensure transfer, it includes: (1) explicit instruction that explains the strategy and when and how it should be used; (2) teacher and/or student modeling of the strategy in action; (3) collaborative group use of the strategy; (4) guided practice and the gradual release of responsibility for instituting the strategy; and finally (5) independent use. Both teacher scaffolding and group collaboration therefore are important components of cognitive text processing instruction. Such an instructional model is especially useful in teaching content area subjects, both those associated with science and those associated with social studies.

Research limitations. The research into cognitive strategy instruction during the 1970's was characterized by experimental and quasi-experimental investigations on the use of strategies applied before, during, and after reading to improve comprehension and recall (Alvermann & Moore, 1991; Bean, 2000). While the benefits of cognitive strategy instruction have been supported by research, the infusion of cognitive processing into instruction across subject areas and subsequent transfer to independent strategy use by students has not met with success (Draper & Siebert, 2003; O'Brien, Stewart, Moje, 1995; Ratekin, Simpson, Alvermann, & Dishner, 1985). A number of factors limited the

research into cognitive text processing instruction. The experimental settings were: (1) contextually different from real classrooms, (2) lacked classroom teacher input, and extensive trials using a variety of texts, and (3) provided minimal instruction on the follow-up application of strategies, and (4) failed to teach for transfer (Alvermann & Moore, 1991). Vacca (1998) summed up the research at this time as being an “atheoretical guise of methods and materials... more or less a bag of tricks” (p. xvi).

There has also been a lack of follow-up to this early research on the classroom implementation of cognitive text-processing strategies (Williams, 2002). Concerns that were never addressed include just how cognitive text-processing strategies can be maintained over time, how instruction can be structured to move effectively from demonstration and practice activities to the reading of connected and authorized text, and whether there is an optimal age at which to begin and bring instruction in cognitive text processing to closure.

Williams (2002) suggest other difficulties with implementing cognitive text-processing strategy instruction that lie in the preparation and professional development of teachers. These include: the concept of direct instruction which continues to be an obstacle in changing from a lecture to teacher-as facilitator format, clarification of the differences between strategies and skills; the challenge of teaching reading comprehension strategies as they relate to particular content areas, and the problem of moving students from isolated strategy practice during initial learning to the application of the strategy to real reading in content area text. All of these limitations require that teachers have both a firm understanding of cognitive text-processing strategies and can respond with flexibility and opportunistically as determined by student needs.

Draper and Siebert (2003) indicate further that the messages content literacy teachers receive neglect, de-emphasize, or misrepresent content. While theoretical models provide background regarding schema theory, interactive, cognitive and constructivist models of instruction, as well as on bridging the gap between the in- and out-of-school lives of adolescents, they provide little insight into helping students “negotiate the text and discourse peculiar to a particular discipline” (p. 2). The literature on implementing cognitive text processing strategies into content area instruction may therefore be almost too glib in purporting to provide an instructional framework that translates easily into developing reading-based lessons in diverse subjects at different levels (Manzo, Manzo, & Estes, 2001). In fact, a model for the effective classroom application of cognitive text-processing strategies across content area subjects has not been found (Williams, 2002). Teachers may also be wary of losing classroom control when they organize students into collaborative groups.

Social Constructivist Paradigm

The basic premise underlying social constructivist views of teaching and learning is that the best opportunities for learning are provided in social contexts in which problems are shared, principles regarding procedures that work are internalized, and strategies are revised and reinforced with repeated practice in functional settings (Langer, 1984). Building on cognitivists’ perspectives, students must be active participants in their own learning. Teachers, therefore, need knowledge not only about subject area content, but also knowledge about instructional procedures and the theory and research that drives them. But more than that, teachers must synthesize and apply their knowledge depending upon who, what, when and where they are teaching. Teachers are thus problem solvers

and decision makers. The traditional model of instruction, as embodied in the lecture method, is not sufficient for developing these kinds of abilities and ways of thinking. Teachers need to assume a reflective stance.

In contrast to the traditional transmission model, which holds that knowledge can be transmitted between two minds or directly internalized from the outside world, social constructivists theorize that learners construct meaning and understanding from within (Brooks & Brooks, 1993) through the process of interacting with their environment (Kamii, 1991). In other words, social constructivists believe that knowledge is constructed by making connections between what one knows and has experienced in the past to what one is experiencing at the moment through the process of dialoguing with others.

Social constructivists believe that knowledge cannot be dispensed to students by lecture format or from text reading alone. It is the interaction between students and teachers discussing their experiences and making personal connections to the topic being studied that provides students the opportunity to construct meaning. A curriculum driven by a social constructivist perspective frees students from the recitation of information. Instead the focus of learning deals with tackling the big conceptual ideas, reformulating these ideas, and arriving at some personal theories (Pearson & Stephens, 2004). Whereas a transmission-guided curriculum views knowledge as a predetermined and finite set of ideas; a social constructivist position encourages students to view the world as a complex place where multiple perspectives exist.

In contrast to the teacher-centered approach of the transmission model, a social constructivist approach places the student at the center of the learning context. The social

constructivist classroom is one that values the experiences and views of both teachers and students and places these at the forefront of learning and teaching. Knowledge is viewed as being under construction and influenced by each learner's prior knowledge. Learners play an important part in their own learning, by linking new ideas with what they already know and collaborating with others to construct knowledge through reading, writing, talking, listening, viewing, and representing.

Time and teacher support are seen as essential in this learning context. Time is needed to allow students to work through their own understanding by talking and discussing with others while the teacher continuously circulates and makes use of "teachable moments" to clarify and elaborate on ideas. From this perspective students are encouraged to assume ownership of their learning (Hiebert, 1994). The social context of the classroom therefore plays an important role in teaching and learning, and has implications for the ways that students and teachers interact and collaborate with each other and the text (Vacca, 2002).

Other characteristics of the learning context where social constructivist principles are practiced include: teachers providing students with authentic literacy tasks which assimilate real-world experiences into classroom learning (Brooks & Brooks, 1993); student-driven-inquiry and topic selection, as well as an appreciation for creativity and critical thinking (McLaughlin, 2000) or thinking that is "outside--the-box". Considerable opportunity is provided for collaborative discourse between teacher and students as well as time for students to reflect personally on their learning (Brooks & Brooks, 1993).

Teachers with a social constructivist perspective view the textbook differently. The authorized text is considered a *support* to idea construction. In other words, students

learn *with the text* rather than *from the text*, the notion of learning *from* the text being rooted in the cognitivist paradigm in which knowledge flows *from* the text *to* the mind. Social constructivists believe that learners learn *with* text, thereby extending the cognitivist perspective. According to social constructivists a transaction takes place between the text and the reader. Readers actively negotiate meaning by making connections between past knowledge and the ideas printed on the page. These connections are confirmed or disconfirmed by collaboratively discussing the issue.

Research under the social constructivist paradigm investigates how different factors influence teaching and learning. Investigations have been concerned with issues such as: how knowledge is constructed through interaction with others; the way that learning from text is viewed through a social constructivist perspective; how literature fits into content area subjects (Bean, 1998); the connection between talking and writing to learn in the content areas (Newell, 1984; Rubin, 1990); and student and teacher perceptions regarding teaching and learning (Lloyd, 1996; Moje, 1996).

The Contextual View of Literacy Learning in School

The contextual view of literacy learning reflects the ongoing search to better understand literacy development within the school setting and the factors within this setting that influence development. This view recognizes the complexity of social influences on developing literacy abilities. Those involved in literacy education need to move toward considering multiple contexts in responding to improving literacy instruction in schools (Raphael, 1984). With the goal of synthesizing knowledge, Raphael and Reynolds (Raphael, 1984) brought together previously disparate but in reality

overlapping strands of academic research on teaching, reading, writing, and the social aspects of development to provide a fuller understanding of literacy learning .

The theory underlying this contextual view of literacy learning was developed first by examining factors that influence learning in general, and second by considering these factors in relation to their influence on literacy development. Our current understanding of the learning process has been largely influenced by the theories of Lev Vygotsky (Vykotsky, 1978) whose work emphasized that learning is the result of social interactions between the learner and a more experienced teacher or more knowledgeable peer. From this perspective, learning and understanding are inherently social (Wertsch, 1991). Vygotsky's work informed us of the interaction between language and thinking, and highlighted the social nature of the learning process in which through talk and collaboration, external knowledge becomes internalized. Eventually, we begin to regulate our own activity and are able, in a conscious manner, to complete new tasks and solve problems successfully.

Raphael (1984) presented a model to conceptualize the social, psychological, individual, and academic contexts that influence literacy development, not unlike the framework described by Sweet and Snow (2002). Raphael's model, however, also takes into account historical-cultural contexts to show that previous influences and constraints still affect current literacy instruction. As illustrated in the accompanying Figure (2.2), Raphael's model is dynamic and demonstrates that there is considerable overlap between and among contexts.

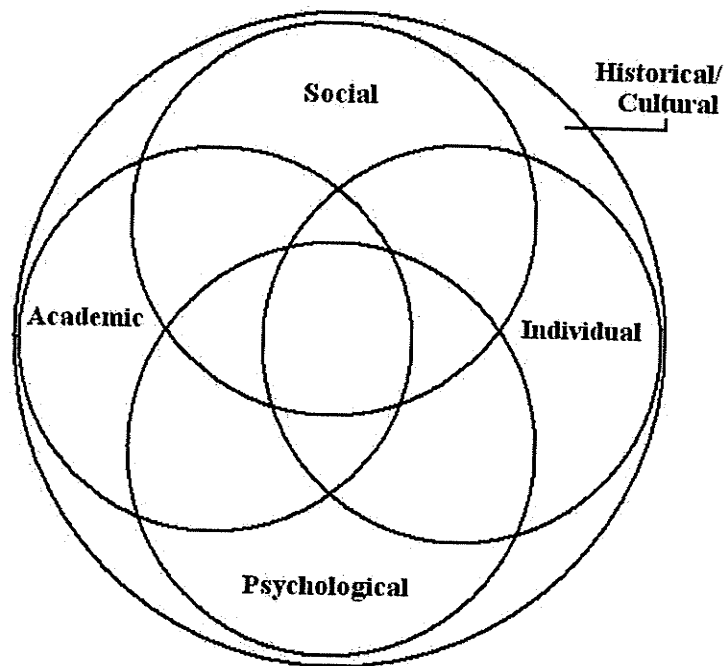


Figure 2.2. A conceptual model of the contextual view of literacy learning (Adapted from Raphael, 1984, p. 297).

Historical-cultural context. The historical-cultural context informs contemporary understanding on the evolution of theories that guided development as well as the underlying classroom experiences of teachers and students. The earliest views of reading, for example, emanated from the perception that learning from text was a skill-based, passive encounter with print, hence the related notion of using a transmission model for instruction. Later, reading was viewed as a meaning-making process, hence the cognitivist perspective that focused on making connections between the new and the known to enhance comprehension and memory and emphasized strategy instruction. Currently, reading is seen as a constructive, dynamic process in which readers bring not only their past knowledge to bear on text comprehension, but also actively discuss the ideas, inferring, and connecting new information to what is understood, hence the social constructivist model.

In addition to historical context, literacy instruction can also be considered as being embedded in present culture. Culture is multi-faceted influencing the school context in a myriad of ways. The current culture of literacy and schooling is connected to the historical past which is brought together in one classroom. History represents the sum total of all of the experiences students have had in the past, as part of the institutions they have attended, and as part of society's influence. Culture is built around the shared belief systems and knowledge reflected in the lives of the students, teachers, schools, and the many aspects which we consider to be education-related. Culture can also be thought of in terms of: (1) the ethnicity of students and teachers (Carew & Lightfoot, 1979; Cazden, 1981; McDermott, 1976); (2) the individual cultures of schools, classrooms, and reading groups (Carew & Lightfoot, 1979; Cazden, 1981; McDermott, 1976); and (3) the divisional and provincial agencies involved in school policy, as well as centres of education that provide pre- and in-service programming and sponsor the research that guides instruction in the schools. There is now, therefore, recognition that the social context also plays a critical role in learning.

Social context. While previously reading was viewed as a solitary activity occurring cognitively inside-the-head of the reader, current theory regards reading as a social process from a number of perspectives (Bloome, 1985). First, reading involves a social interaction with the author, and second, the experience of reading a book is part of the practice of a literate culture. Third, by reading, one is interacting with the ideas, information, ways of thinking and problem-solving that are part of the current culture. At the opposite end of the continuum lie psychological factors.

Psychological context. The psychological context related to literacy development involves the self-perceptions learners have about themselves as learners including perceptions others have about the learner, such as the teacher, other students, and parents, for example. Included in the psychological context are the motivational factors that drive students to read and apply strategies, as well as attitudinal factors that recognize the value of reading.

Paris, Lipson, and Wixson (1983) believe that psychological factors are responsible for the three kinds of knowledge that good readers bring to the reading process. First, declarative knowledge or factual knowledge refers to the understanding that reading is a process of making meaning from the print on the page, while writing is the process of communicating ideas to others. Procedural knowledge is the knowledge of how to learn through the application of different strategies. These cognitive strategies include, but are not limited to, the following: using surrounding text to help figure out an unknown word, previewing a text to develop a sense of the main ideas to be discussed, and using brainstorming before writing to generate topics of interest. The third form of knowledge that falls under the rubric of the psychological domain is conditional, knowledge or when and why. That is, knowing when to and why one should apply certain strategies, being motivated to do so, and believing that one can be actively strategic during the reading process (Weinstein, 1984). Interacting with social and psychological contexts are individual abilities and competencies.

Individual learner. The Raphael model (1984) also takes into consideration individual differences such as ability and developmental level, as well as unique, and shared life experiences that influence responses to learning and the learning environment.

While the psychological and individual learner contexts are closely aligned, they may influence one another in disparate ways. For instance, a student may be psychologically motivated to apply a problem-solving strategy, but lack experience in applying such a strategy. The academic learning task may also interact with all other variables.

Nature of the academic task. The context of the academic task refers to the kinds of reading and writing activities assigned and the factors that impact on the ability to participate. These factors are part of the teacher's instructional decision-making and include the difficulty level of the text, the type of text to be read, whether narrative or expository, the content area, the nature of the activity itself, the degree of teacher and/or peer support, and the time allotted for task completion.

The contexts discussed above do not function in isolation. They are interrelated and influence one another so that learning is influenced by multiple factors, not unlike the conceptual model highlighted by Sweet and Snow (2002) reviewed previously.

Summary

Research in improving literacy education for all students has moved from the laboratory-controlled studies of the 1970's to the naturalistic setting of the classroom. This movement has been inspired by a growing appreciation of the complexity of teaching and literacy learning. Many variables influence learning, those within the classroom itself, and those that an increasingly diverse student population brings to learning as part of their life experience. Coupled with this classroom diversity, life continues to evolve and with it what one needs to become fully literate. Technology, workplace demands, and problem-solving issues previously unheard of require readers to apply text- processing strategies independently, to build conceptual understanding, to

communicate both orally and in writing, and to have an inner desire to read and write. Classroom diversity and increased demands on literacy have resulted in what could be considered an instructional crisis that requires the same consideration given to teaching beginning reading.

Among the considerations that classroom teachers must take into account in developing instruction are the cognitive strengths and abilities of the reader, the difficulty level of the learning material, the learning task itself, and the socio-cultural context that includes not only teacher expectations and the nature of student-to-student and teacher-to-student interactions, but also the values, language and literacy practices inherent in each student's culture which may or may not match those of the school. Sociocognitivists stress that it is the interaction between the teachers and students and between the students themselves that facilitates understanding and knowledge building. There may be personal costs for students, however, when they "buy into" the academic community (Gee, 1999). They may be reluctant to do so.

With growing insight into the subtle intricacies of classrooms, current instructional theory has shifted from valuing a transmission model of teaching in which knowledge was viewed as a commodity that could be transmitted easily from one person to another, to a constructivist paradigm in which learners were perceived as being actively engaged in building their own knowledge. More recently, sociocognitivists have stressed the importance of social interaction to facilitate learning. Our perception of ideal teaching has therefore moved from a format of direct lecturing to modelling and demonstrating metacognitive strategies that students would be able to apply later when processing material independently.

But sociocognitivists and linguists point out that it is language that helps individuals make connections to different cultural, social, and institutional ways of thinking, feeling, acting and talking. In this sense language is an experiential phenomenon that is value-laden, containing feelings, attitudes, roles, and scripts. Content are reading classes therefore need to move beyond the one-dimensional focus on print and incorporate opportunities for discussion and collaboration that consider multiple points of view. Our understanding of the learning process has thus shifted from a behaviorist, to a cognitivist and socio-cultural stance.

Given the realities of the classroom, these theories may not be easily translated into practice. Straw (2002) classifies instructional practice into four quadrants that capture high levels of group interaction and collaboration (social constructivist theory) and high levels of scaffolding (cognitivist paradigm) in which teachers stress cognitive text processing strategies by modelling and demonstrating, in contrast to more traditional transmission approaches to instruction in which students assume the role of passive listeners and teachers dominate. The transmission model of instruction is characterized by low collaboration and low teacher scaffolding. Actual classroom teaching may be much more eclectic, nonetheless.

This study therefore explored the perspectives of middle and senior years content area teachers on both instructional approach and awareness of cognitive text processing strategies. The second part of the study interviewed a set of teachers who ranked high on Straw's (2002) instructional model in terms of both high scaffolding and high collaboration to determine the challenges they face in implementing cognitive and social constructivist theories in their classroom instruction.

CHAPTER 3

Methodology

This study was exploratory in nature. Its purpose was to examine the implementation of social constructivist and cognitive text-processing theory and research by identifying the most predominant overall approach guiding classroom instruction (transmission-style lecture, scaffolded instruction, use of collaborative learning groups or a combination of scaffolded instruction and collaborative learning groups) and the most often used before, during, and after cognitive text-processing strategies employed by middle and senior years social studies and science teachers. Further, the study explored the relationship between such teacher demographics as level of education, year of graduation, years of teaching experience, gender, age, subject areas taught, years teaching a subject area, number of teachers teaching the same subject in a school, school location, and number of students in a school to determine whether these factors had an effect on instructional approaches and the use of cognitive text-processing practices.

An additional focus of the study was to examine the practices of teachers using a social constructivist approach, that is scaffolding and collaboration, in order to gain insight into their instructional practices and challenges. This was achieved by conducting in-depth interviews with a sample of content area teachers to explore issues associated with theoretically-driven and research-based literacy practices. Teacher interviews also sought to gain more insight into social-cultural factors that influenced instruction including classroom make-up and administrative pressures.

A mixed methodology approach was employed as described in the next section of

this chapter.

A Mixed Methodology Approach

A mixed methodology research approach, employing both quantitative and qualitative methods was selected since investigation into blended methodology has proven to strengthen a study. A questionnaire format using quantitative methodology was used as the vehicle to survey a sample of teachers to provide demographic information, and to serve as the instrument to identify teachers using social constructivist practices (scaffolding and collaboration) in their teaching. Nau (1995) believes that whenever possible the investigator should blend both quantitative and qualitative research to benefit from the contributions of each, while Hillocks (1992) states that quantitative and qualitative research are not mutually exclusive, and points out that the claims which arise out of one methodological perspective serve in a complementary way to support or cast a shadow of doubt on the research findings of another methodology. The interview data further confirmed the identification of teachers using high levels of scaffolding and collaborative practices and provided further insights into their instructional programs and the challenges faced when teaching based on a social constructivist philosophy. Chenail (2000) asserts how a mixed methodology method allows the examination of a topic from multiple perspectives by triangulating theory, participants, data, and analyses to produce fuller descriptions, explanations or interpretations. Jayaratne (1993) suggests that qualitative data can be used to support and further explain findings from empirical research.

This study followed the mixed methodology perspective by beginning with a questionnaire that surveyed the responses of middle and senior years science and social studies teachers on their instructional practices and concerns and their use of cognitive text-processing strategies. Ten teachers were then selected to be interviewed based on their use of high levels of scaffolded and collaborative teaching practices as evidenced by questionnaire responses. The interviews provided the experiential data to support survey findings and to gain more insight into the concerns and challenges faced in implementing social constructivist approaches to instruction.

Recent studies of literacy learning view the classroom in the context of a sociocultural community (Stewart, O'Brien & Moje, 1995). The process of naturalistic inquiry as a research tool for studying the classroom context seeks to gain the insight of the teacher as the insider, as the one who experiences the day-to-day reality of the situation, and whose personal philosophies and perspectives influence teaching and learning (Bean, 2000). It is believed that exploring the personal perspectives of teachers in the field will contribute to our understanding of the realities of teaching in today's schools (Bean, 2000).

General Description of the Study

The first part of this study was quantitative in nature, asking teachers to respond through a questionnaire to: (1) demographic information identifying level of education, year of graduation, years of teaching experience, gender, age, subject areas taught, years teaching subject, number of teachers teaching this subject area in the same school, school

location, and number of middle and/or senior years students in the school; (2) identify the predominant approach used in instruction (transmission-style lecture, scaffolded instruction, use of collaborative learning groups or a combination of scaffolded instruction and collaborative learning groups; and (3) identify the use of before, during and after cognitive text-processing strategies.

In the second part of the study, based on qualitative methodology, a selected sample of ten teachers who through their questionnaire responses revealed the use of high levels of scaffolding and collaboration in their instruction were invited to participate in follow-up interviews to provide more insight into their teaching practices and challenges, use of cognitive text-processing strategies, and the social and cultural factors that influence instructional decisions in relation to teaching adolescents. The interviews sought both cognitive and affective data (Marsh, Rosser, & Harre, 1978) to discover the challenges teachers face in (a) implementing scaffolded instruction, (b) organizing collaborative learning groups, and (c) teaching cognitive text-processing strategies. Teachers were asked approximately six open-ended interview questions with supplementary probes (Appendix B). Additional questions evolving from the questionnaire responses and the interview itself were also incorporated into the interviews.

Participants

Part 1: Quantitative Methodology

The intent of this study was to distribute the questionnaire to middle and senior

years content area teachers in all six school divisions in the greater metropolitan area of a Western Canadian prairie province city. The school divisions represented different geographic locations in the city (North, South, East, West and inner city) and reflected a broad range of socio-economic and educational characteristics of the city's population. Potential participants were teachers of content area subjects in the middle years: geography, history, and science; and senior years: history, geography, world issues, and biology, physics, and chemistry.

The original plan was to request the participation of only those middle years teachers teaching in middle school settings since it was believed, from a theoretical point of view, that teachers of middle years classes in elementary schools would most likely follow the teaching methods of the elementary curricula rather than employ a middle school approach more akin to middle and senior years practices. This decision was changed when it was discovered that many of the school divisions continued to house kindergarten through grade six and up to grade nine (Senior 1) in the same building, thereby significantly reducing the pool of middle years science and social studies teachers.

It was interesting to note that each school division used a different structure to organize its schools. While some schools maintained the more current structure of middle and senior high levels (grades five to eight in one building and grades nine to twelve in another), other divisions had schools that included students from kindergarten to grade nine (Senior 1) then proceeding to schools with grades ten to twelve (Senior 2 to Senior

4); with one division having a school consisting of grades seven to twelve (Senior 4) and another school serving grades seven to nine (Senior one). Only a small number of schools were designated as middle years schools. It was therefore decided to include schools with students from kindergarten to grade eight or nine (Senior 1) in the sample, since these schools are often organized into early, elementary, and middle school departments.

Superintendents of five out of the six contacted divisions consented to have their schools participate in the study. All geographic areas of the city (North, South, East, and West) including two inner city schools were represented in Part 1 of the study. Thirteen schools participated – three kindergarten to grade nine (Senior 1) schools; one school designated as a middle years school (grades six to eight); two schools of grades seven to twelve; five senior years schools of grades nine to twelve (Senior 1 to 4); and two senior years schools of grades ten to twelve (Senior 2 to 4).

The potential number of participants from this pool of consenting schools was one hundred and sixty-three. The final response rate for Part 1 of the study (the questionnaire) was forty percent.

Part 2: Qualitative Methodology

Ten teachers were selected to be interviewed in the second part of the study. The selection criteria was based on the highest scores on the items in Form B of the questionnaire, items designated as scaffolded or collaborative approaches to instruction. This selection criteria was based on the belief that teachers who used social constructivist practices would best be able to reveal the challenges associated with implementing these practices in their classrooms. The number of interviewed middle years students was small

due to the reduced availability of classes that were not part of the elementary school (N = 2). Of the two middle years teachers who participated, each from a different school division, the male teacher taught in a middle years school setting and the female in a kindergarten to grade nine (Senior 1) school. The remaining eight teachers were all senior years teachers representing seven different schools, in four school divisions, all located in the suburbs.

Procedure

Part 1: Quantitative Methodology

School superintendents in each of the school divisions were sent a letter inviting the participation of both middle (social studies, geography, history, and science) and senior years teachers (biology, physics, chemistry, history, geography, and world issues) in a two-part study. Once permission was granted for school division participation, letters were forwarded to individual school administrators. Following their agreement, prepared packages containing a letter seeking teacher participation accompanied by the questionnaire (Appendix A) were delivered to each school either by courier or a research assistant.

Part 2: Qualitative Methodology

Selection of interviewees. Open-ended interviews were conducted with a small sample of teachers (N=10). Participants were chosen by applying the greatest likelihood principle, that is, teachers selected to be interviewed were those whose instructional practices were characterized by survey responses that reflected high scaffolding and high collaboration. According to Straw's (2002) instructional approach categories, these teachers' instructional practices would fall in the high scaffolding and high collaborative

learning group quadrants. It was believed that such teachers would be confident about their instructional practices and best able to share their insights into personal experiences and the challenges they faced in implementing practices based on current instructional theories.

Format of interviews. One, one-hour long interview was conducted with each of the ten teachers at a self-selected location within their school. Six open-ended questions invited participants to reflect on their teaching experiences and questionnaire responses. Prompts accompanied each question to assist the interviewer in probing further. (See Appendix B.) An open-ended questioning format was used so that participants could address their own personal experiences in following a social constructivist approach to instruction, including scaffolding, collaborative group learning and teaching cognitive text-processing strategies. With teacher permission, the interviews were audiotaped for transcription and investigator notes were made.

Anonymity. To ensure anonymity, the selected teachers were contacted for interviews in the following way. A letter code designating the school division and the school was assigned to each questionnaire. These codes were also recorded on an accompanying master coding sheet given to each school. Before distributing the questionnaire, the school-based designate (principal or non-teaching individual assigned by the school administrator) placed the initials of each teacher beside their questionnaire code on the master sheet. This sheet remained in the possession of the school, and inaccessible to the researcher throughout the study in order to protect the anonymity of

the survey respondents.

Contacting interviewees. Once teachers had been short-listed for interviews, the investigator then consulted with the school using the number code and asking the school-based designate to match it to the initial on the master sheet to verify whether agreement to participate in part two of the study had been given. Where affirmative responses were received, the identity of the teacher was shared with the investigator who then contacted each teacher by telephone or e-mail to confirm participation in the interview part of the study and to arrange a time and place to meet.

Measures

Part 1: Quantitative Methodology

Validity. Answers given to research questions in the form of questionnaires have long been considered valuable, in fact, most of what is known or is thought to be understood about human behaviour has been acquired from answers to research questions posed in questionnaires (Peterson & Kerin, 1981).

Design. The questionnaire consisted of three main parts: Forms A, B, and C. (Refer to Appendix A.) With brevity in mind, and respect for teachers' busy lives, a mainly checkbox-reply format was used and, in addition, some brief responses in Form A (identifying credentials that were not identified in the questionnaire, year of graduation, and identification of subject areas taught) and in Form B, the use of numbers to rank order five items.

The questionnaire consisted mainly of a closed-ended format. This format

provided the most effective way of listing instructional practices that teachers could then rate according to prevalence in their instructional program. The benefits of the closed-ended question (Peterson, 2000) format are: (1) requires less participant time, (2) reduces the number of participants who choose not to participate, and (3) is relatively easy to code, analyze, and interpret.

Form A solicited information related to teacher demographics in order to create a profile of middle and senior years teachers of social studies and science involved in adolescent teaching and learning. These demographic characteristics included level of university education, year of graduation, total years teaching, gender, age, subject areas teaching, years teaching those subjects, number of teachers in this subject area in the same school, school size, and school location.

Form B asked participants to respond to thirty items highlighting the most salient and pervasive characteristics of a transmission-style lecture approach to instruction, a scaffolded instructional approach, and the use of collaborative learning groups. The characteristics of a transmission-style lecture approach, scaffolded, and collaborative teaching practices are clearly delineated in literacy theory and research (Duke & Pearson, 2002; Flood, Lapp, & Fisher, 2003; Tierney & Cunningham, 1984), permitting the development of questions to which teachers could respond and that could be analyzed with reasonable validity.

Typically, the lecture method focuses on the transmission of knowledge and memorization of content; information being viewed as a transferable commodity. For

example, questionnaire item number 6 targeted the transmission lecture-style approach in the statement, "Have students copy notes from the board or overhead". Scaffolded instruction refers to teacher support and guidance as students are learning with the intent of (1) gradually reducing the amount of required support as learners develop greater understanding and independence, and (2) providing enough support to guarantee learner success while still ensuring student ownership and challenge. Item number twelve, for example, required teachers to identify the degree to which they used "metacognitive strategies (tips for learning or remembering to help students read or study)."

Collaborative learning refers to students interacting with the teacher and their peers in the construction of knowledge. For example, item number two of the questionnaire asked whether teachers, "[Had] students work in groups to talk and share their ideas".

Questionnaire statements were in no way exhaustive of the elements of these teaching practices, but represented the central characteristics underlying, transmission style, scaffolded, and collaborative approaches to learning. The classification key for questionnaire items is included in Appendix A.

Form C of the questionnaire focused on the use of cognitive text-processing strategies used before, during and after reading. These items were developed by reviewing a number of content area university textbooks and chapters in handbooks on cognitive text-processing strategies: Alvermann and Moore (1991); Pressley (2000), Flood, Lapp, and Fisher (2003); Block, Collins, and Pressley (2003); and Duke and Pearson (2002). For example, questionnaire item number 2 is a before reading strategy to

“Activate and build background knowledge”; questionnaire item number 15 is an example of “[Teach] self-monitoring strategies” to guide comprehension while reading text; and questionnaire item number 30, “Have students write about their understanding” is an example of the third type of cognitive text-processing strategy used after reading.

A number of factors were considered in constructing the questionnaire items. Items were kept brief and specific, and focused on singular issues to avoid ambiguity. Questions were worded objectively, using the professional language of the classroom teacher and avoided the use of research-based or theoretical terminology that might alienate participants. The use of jargon was avoided to minimize the chances of multiple interpretations of terms. Questionnaire statements were in no way exhaustive, but represented the central, underlying characteristics associated with each concept.

Item validation. Items on the questionnaire were reviewed, critiqued and refined leading to modifications in both format and wording. The questionnaire was piloted with four different sets of professionals involved in literacy: (1) two professors in the field of language and literacy, (2) students enrolled in two post graduate courses in education, one of which was at the doctoral level, (3) two experienced reading specialists, and (4) two middle school classroom teachers.

One other validation technique was used in the last section of Part B of the questionnaire. Teachers were asked to choose the five instructional items they used or were concerned about most often from the list of 30 items. The purpose of this follow-up ranking was to confirm the main instructional approach identified by teacher responses as

being mainly transmission-style lecture approach, scaffolded instruction, use of collaborative learning groups or a combination of scaffolded instruction and collaborative learning groups.

Format. The 30 questionnaire statements were randomly ordered in the survey to: encourage teachers to consider each item separately, guard against providing cues to the desired responses and avoid a suggestive pattern of response, as well as bias toward one view or another.

For Form B of the questionnaire regarding predominant instructional approach, teachers were asked to indicate the extent to which they used each of the practices in their teaching (never = 1, seldom = 2, sometimes = 3, often = 4, very often = 5). In Part C of the questionnaire teachers were asked to indicate the extent to which they used the 37 before, during, and after reading cognitive text-processing strategies. The corresponding rating scale was identical to that used in Part B, except that it included the addition of a sixth choice, "not familiar with".

Part 2: Qualitative Methodology

Interview questions: Interview questions were developed to elicit conversation toward the questions being researched. Teachers were asked to respond to different aspects of teaching and learning and as well as to professional issues while the focus of these questions served as categories later in the data analysis.

The categories that were addressed by the interview questions related to: student backgrounds, instructional practices and assessment, challenges, professional development, teacher preparation, divisional and school level support, and adolescent

students as learners. The responses of teachers to these issues was open-ended and related to personal experience and therefore not pre-conceived by the researcher. Teachers were also invited to respond to and elaborate on their responses to the items in Forms B and C of the questionnaire, that is, their use of particular instructional approaches and teaching concerns as well as their use of cognitive text-processing strategies.

Grounded Theory and Constant Comparative Method

The interview data were analyzed using a grounded theory approach in which the emergent themes are believed to be present within the data, only to be discovered by the researcher (Glaser & Strauss, 1967), as well as through the constant comparative method (Glaser & Strauss, 1967) in which the investigator simultaneously codes, categorizes, and makes notes while searching for new and recurrent themes. The strength of the interview analysis in this study was predicated on the first-hand knowledge that teacher interviewees could offer, based on their high use of scaffolding and collaboration and the richness of their professional experience in working in content area subjects with adolescent students over a number of years.

Analysis

Part 1: Quantitative Methodology

The questionnaire was designed to: (1) create a demographic profile of the teachers who participated in the questionnaire, (2) explore predominant approaches to content area instruction and the use of cognitive text-processing strategies at the middle and senior years level, as well as (3) examine the relationship between these two variables to each other and to demographic data, in order to answer the following questions.

1. What are the characteristics of the teachers who participated in this study in terms of a demographic profile?

This question was analyzed through the use of frequency counts.

2. What is the most predominant approach to instruction used by middle and senior years teachers in this sample? Do teachers in this jurisdiction use mainly a transmission lecture style approach, a scaffolded approach or a collaborative approach to instruction?

A two-step cluster analysis using the distribution of teacher questionnaire responses was employed to ascertain the most predominant instructional approach. These distributions were then examined to establish the most salient patterns.

3. What are the five most frequently used instructional approaches used by middle and senior years teachers in this study?

The data for this question was contained in the last section of Part B of the questionnaire. Teachers were required to choose five items from the first section to indicate their most frequently used instructional approaches and concerns. A descriptive analysis using frequency counts was used to identify these rankings.

4. What is the nature of the use of the cognitive text-processing strategies (before, during, and after) that teachers use?

This question was answered by carrying out frequency counts.

5. Are there statistically significant differences in the frequency of use of cognitive text-processing strategies before, during or after reading?

The analysis of this question was combined with the analysis of question six using a two-way analysis of variance with repeated measures and Bonferroni post hoc tests to locate the source of the differences.

6. Is there any relationship between predominant approach to instruction and the use of cognitive text-processing strategies before, during, and after reading?

This question, along with question five, was explored by conducting a two-way analysis of variance with repeated measures using the major instructional approach clusters and before, during and after reading strategies as independent variables, followed by multiple comparisons using Bonferroni to establish whether teachers employing a mix of high scaffolding, high collaboration and low transmission approaches used before, during and after reading strategies more often than those employing a mix of high scaffolding, low collaboration and low transmission, and those low in each of these approaches.

7. Are there differences between content area teachers according to instructional stance (transmission-style lecture approach, scaffolded instruction, use of collaborative learning groups) and such demographics as (a) level of education, (b) year of graduation (c) years of teaching experience, (d) gender, (e) age, (f) subject areas taught, (g) years teaching a subject, (h) number of teachers teaching the subject in the same school, (i) school size, and (j) school location? The data related to this question was analyzed using a chi-square analysis.
8. Are there differences between content area teachers according to the use of cognitive text-processing strategies and demographics, including (a) level of education, (b) year of graduation (c) years of teaching experience, (d) gender, (e)

age, (f) subject areas taught, (g) years teaching a subject, (h) number of teachers teaching the subject in the same school, (i) school size, and (j) school location.

The relationship between predominant approach to instruction and demographics (question 7), and between the use of cognitive text-processing strategies and demographics (question 8) was examined through the use of analysis of variance.

Part 2: Qualitative Methodology

The questions that guided the interviews in the second part of the study focused on the experiences of teachers using social constructivist practices, particularly their instructional practices and challenges faced in implementing those practices as well as perceptions of adolescents as learners.

In preparation for each interview, individual teacher responses to Forms B and C were reviewed to develop questions seeking elaboration on the use of teaching approaches and concerns and the use of cognitive text-processing strategies. For instance, one question asked was, "You indicated in the questionnaire that you have students work in groups to talk about and share their ideas, can you elaborate on this? How do you do this?"

Sometimes the same questions were asked of teachers to seek more in-depth insights, and at other times the researcher would ask about other issues initiated by teacher questionnaire responses to seek insights into other categories yet to be explored. This was determined by reviewing: field notes from interviews with other teachers in the sample conducted previous to the current interview, categories already discussed from the interview questions and questionnaire items, and determining categories that needed further elaboration. While structure was provided by the interview questions

developed at the start of the study that addressed the major research questions and additional questions regarding teacher responses to questionnaire items, the direction in which teachers responded was open, with the researcher remaining perceptive to data that introduced new ideas and thoughts.

The research questions that guided the interviews were:

9. Are there common, shared characteristics between teachers who use social constructivist approaches in their teaching?
10. What do the instructional programs of teachers using social constructivist practices look like?
11. What do content area teachers perceive as the concerns and challenges they face?
12. Is there sufficient support from the division and school level to fulfill teachers' professional development needs?
13. How do teachers perceive their workplace environment in terms of curricula, timetabling, class size, and composition?
14. What do teachers know about their adolescent students that informs their instruction?

Analysis. During the interviews themselves, a number of themes began to emerge, and these were recorded in the form of an analytic memo and were continuously referred to with each successive interview as well as during the analysis of the transcripts in a continuous search for meaning to detect emerging new themes. Each subsequent transcript was read by keeping in mind the themes, patterns, topics, and categories of the preceding transcripts, while at the same time searching for data that added new ideas.

During the data analysis process, each transcript was read over deliberately, sentence by sentence. Every effort was made to suspend personal perspectives and biases in order to “listen” to the personal views and insights expressed by each teacher.

Analysis of the transcripts was structured by searching for data responding to the categories from the interview questions (Appendix B) and teacher responses to questions asking them to elaborate on their responses to questionnaire items regarding instructional approaches and concerns and their use of cognitive text-processing strategies. Data that related to the categories was coded in the margins identifying the category or some aspect of the category and included a brief descriptor. For instance, one teacher discussed how he sometimes allowed students to choose the group members they wanted to work with but in this process found that some students were left out of groups. This was coded with the theme “use of groups” with an added description of “difficulties and considerations”. Each transcript was coded in this way, keeping in mind earlier findings from previous transcripts in order to detect patterns between transcripts, and to determine connections between teacher comments and new emerging themes.

Over time and additional transcripts, some themes continued to recur. As similar themes began to be revealed in other transcripts, descriptor notes in the margins began to reveal both shared and differing insights regarding the same theme.

After analyzing two or three transcripts, I began to write about those themes that had emerged a number of times throughout the transcripts. Writing helped to sort through an enormous amount of data, allowing me to begin to formulate ideas on paper, and see connections between the themes.

To illustrate, I refer back to the aforementioned example, in which, interviewed teachers, seemed to use the same strategies when grouping students. In writing up my interpretation of teachers' descriptions about this process, I wrote that teachers often allowed students to choose their own group members for short term assignments. Several teachers indicated that because friends often sit near each other, having students group themselves leads to efficiency in terms of time. With the additional insight from another teacher that friends were generally similar in academic ability, the idea emerged that these were homogeneous groupings, academically. In effect, it would seem that homogeneous groups were used both to make efficient use of time and for assignments of short duration. At the same time, teachers talked about grouping students with others that they do not necessarily interact with on a daily basis because students needed fresh perspectives and this is what happens in the real world. These groups were a mix of students, often at different levels of academic ability. Some of the teachers discussed how having students of high ability in a group helped to support low performing students. The concept then emerged that heterogeneous groupings were often used by teachers to support the learning of struggling students.

Writing about the findings helped me, as the investigator to think through the data and to see evidence of overlap between themes. This led to the creation of a main or comprehensive theme. Writing also helped to move the data from the individualized context and to consider the overall scope of teaching and learning. In some instances, as discussed in the previous example, themes between transcripts began to reveal connections to one another, and in this way the themes merged into a broader all

encompassing concept that explained a larger piece, if you will, of the teaching-learning experience of the interviewed content area teachers.

On the other hand, sometimes themes that were not directly related seemed to merge into an overall theme. Such is the case with the question referring to teacher concerns about covering curriculum content (Form B of the questionnaire) to which teachers responded that generally, covering content was not a concern since they knew their content area and focused instruction on overall concepts. This response related to professional development opportunities provided by the school and school division. Several teachers explained that they used the Internet to network with other teachers in the same discipline. Further, they described how important it was to them to keep current in their discipline area and current teaching and learning strategies. They were thus life-long learners. Ultimately, teacher responses to these question probes led to the emergence of three themes: (1) Subject area competence, (2) Teacher as learner, and (3) Professional development which together merged into the overall theme of Teacher Knowledge.

At other times, topics that teachers addressed in response to interview questions or probes and elaborations on questionnaire items, became subthemes. The main theme remained the same as the focus of the question or was renamed to capture the combined notion of the subthemes. For instance, pertaining to the questionnaire item regarding use of testing, teachers were asked, You indicated on the questionnaire that you use testing, could you elaborate on this further? Teachers discussed a number of issues while reflecting on testing, each of which became a theme, for example variations in testing, unconventional testing, the use of grading rubrics, peer assessment, teacher accountability, grades, and parental demands.

As new transcripts were analyzed, other themes were added and sometimes sub-themes were developed and subsumed under pre-existing themes. Eventually saturation of the data was reached. At this point themes were repeated with no new insights. The following main themes resulted from the analysis of the transcripts:

- Teacher Knowledge
- Beliefs about Teaching and Learning
- Instructional Practices
- Assessment
- The Challenge of Time in Teaching Content Area Subjects
- Adolescent Culture

Summary

This chapter has described the mixed methodology research approach that addressed the fourteen research questions. Questions one through eight were answered quantitatively, through a questionnaire, while questions nine through fourteen were responded to through qualitative methodology by interviewing ten teachers. In the next chapter, findings are presented from (1) the questionnaire data analysis that was descriptive and statistical in nature, as well as (2) the interview data analysis that employed grounded theory and the constant comparative method.

CHAPTER FOUR

Analysis

This study explored the knowledge, beliefs, teaching practices and challenges facing middle and senior years content area teachers of social studies and science. The research took place in two parts. Part 1 consisted of the administration of a questionnaire (Appendix A) that required teachers to: (1) enter demographic information regarding their level of education, year of graduation, years of teaching experience, gender, age, subject area taught, years teaching that subject, number of other teachers in that subject area in the same school, school location, and number of students in the school, (2) rate instructional approaches employed or concerns held, and (3) identify their most often-used cognitive text-processing strategies. The goal of Part 1 of the study was to create a demographic profile of the teachers in the sample, identify their most predominant instructional approach (transmission, collaboration, scaffolding or a combination), as well as their use of cognitive text-processing strategies.

Based on survey responses from Part 1, in the second part of the study ten of the teachers whose predominant instructional approach was high scaffolding and use of collaborative learning groups, or a combination of the two, were chosen to be interviewed. The underlying premise was that by identifying and interviewing teachers who self-selected the greatest number of items describing scaffolding and collaborative teaching approaches, the demographic characteristics shared by teachers using research-based instructional practices would be revealed.

The research questions guiding Part 1 of this investigation were directed at identifying: (1) the demographic characteristics of the middle and senior years teachers

in the research sample, (2) the most predominant instructional approach, (3) the use of cognitive text-processing strategies, (4) the relationship between instructional approach and use of cognitive text-processing strategies, (5) the relationship between demographics and instructional approach, and (6) the relationship between demographics and the use of cognitive text-processing strategies.

Findings from the Questionnaire—Part 1: Quantitative

Demographic Profile

The focus of the first question was to provide a demographic description of the teachers who participated in the study. Sixty-five teachers responded to the questionnaire. Participants were from thirteen schools representing five school divisions that responded to the request to take part in the study. Questionnaires were sent to teachers in February of the school year with letters of reminder following in March. The last questionnaire was returned in May. Frequency counts were used to create a profile of the teachers who participated in the study with educational credentials being examined first.

Highest Educational Credential

Analysis of teacher responses (Table 4.1 which follows) indicated that the majority (76.9%) held a Bachelor's degree, while 13.8% had a Master's degree, 6.2% a Teacher's Certificate, and 3.1% Doctorates.

Table 4.1

Level of University Education

Level of Highest University Education	Percentage of Teachers	Number of Teachers
Bachelor's	76.9	50
Master's	13.8	9
Teacher's Certificate	6.2	4
Doctorate	3.1	2

Year of Graduation

Year of graduation refers to the year the highest academic credential was obtained. Not all teachers responded to this item. The responses for the sixty-two teachers who did respond are depicted in Table 4.2.

While the earliest year of graduation reported by one teacher was 1969, the period from 1969 to 1993 represented the lowest number of graduating teachers (1.5 – 3.1%), with the exception of 1984, 1985, and 1991 (4.6%). By far the greatest number of teachers graduated during the period from 1994 to 2004 (4.6 – 6.2%), although the years 1996, 1997, and 2003 (1.5 – 3.1%) represented an exception. None of the participants reported graduating in the following years: 1971, 1973, 1975, 1976, 1978, 1980, and 1987.

In seeking a pattern to the year of graduation, overall findings indicated that the majority of teachers in the sample either graduated or earned their highest academic

credentials during the period from 1994 to 2004, which suggests that their training was relatively recent.

Table 4.2

Number of Teachers Graduating Per Year

	Number Per Year	% Per Year	Years	Exceptions
Highest	3 - 4	4.6 - 6.2	1994, 1995, 1998, 1999, 2000, 2001, 2002, 2004	1996, 1997, 2003
Lowest	1 - 2	1.5 - 3.1	1969, 1970, 1972, 1974, 1977, 1979, 1981, 1982, 1983, 1986, 1988, 1989, 1990, 1992, 1993	1984, 1985, 1991

Number of Years Teaching

The range for number of years teaching was: 0 to 3 years (n = 11); 4 to 7 years (n = 12); 8 to 13 years (n = 12); and 14+ years (n = 30), differentiating among beginning teachers, more experienced teachers, highly experienced teachers, and veteran teachers. As seen in Table 4.3 on the following page, teacher responses indicated that eleven teachers were at the beginning of their careers as educators, twelve were more experienced, twelve were highly experienced and thirty were veteran teachers. Beginning teachers comprised the smallest group (16.9%) of content area teachers, 37% of the teachers falling into the more and highly experienced category, with the majority who participated (46.2%) being veterans in the field.

In examining the discrepancy between years of teaching experience (almost 65% of the teachers in the sample being either highly experienced or veteran educators) and the finding that the majority of teachers earned their highest academic credential relatively recently (during the period from 1994 to 2004), it is assumed that a number of

teachers resumed studies and upgraded their credentials either while teaching or after having been in the field for a number of years.

Table 4.3

Years of Teaching Experience

Number of Years Teaching	Percentage of Teachers	Number of Teachers
0 – 3	16.9	11
4 – 7	18.5	12
8 – 13	18.5	12
14+	46.2	30

Gender

There seemed to be approximately equal numbers of male and female teachers in the sample. A perusal of gender figures indicated that of the sixty-five respondents, twenty-nine teachers were female and thirty-six male, representing 44.6 and 55.4 percent of the total number of respondents, respectively (See Table 4.4).

Table 4.4

Teacher Gender

Gender	Percentage of Teachers	Number of Teachers
Male	55.4	36
Female	44.6	29

Age

The analysis of data related to the age of the content area teachers in the sample, as indicated in Table 4.5, showed that those between the ages of 31 to 49 years represented the largest number (60%), those under thirty years comprised 20% of the respondents, and those between 50 and over 60 made up the remaining 20%. Teachers 60 years and older represented 3.1% of the latter group.

Table 4.5

Teacher Age

Age	Percentage of Teachers	Number of Teachers
Under 30	20	13
31 -49	60	39
50-60 ⁺	20	13

Summary

Demographic findings indicated that the highest level of education attained by the majority of content area teachers was a bachelor's degree. The majority of teachers either graduated or achieved their highest credential during the period from 1994 to 2004.

Veteran teachers, with fourteen or more years of teaching experience, accounted for the largest number of teachers in the sample.

Content area teachers were fairly equally represented by both genders. Teachers within the age range from 31 to 49 represented the largest group, with those under 30 and those between 50 and over 60 years making up 20% of the teachers in the sample.

As shown in Table 4.6, the overall profile of science and social studies middle and senior years teachers in this study consisted of highly experienced or veteran teachers

having between 8 and over 14 years of classroom experience, holding a bachelor's degree, having received their highest teaching credential relatively recently (within the last ten years, from 1994 to 2004), being either male or female, and falling within the age range of 31 to 49 years.

Table 4.6

Overview of Level of Education, Year of Highest Degree, Years of Experience, Gender and Age

Level of Education (% of Teachers)	Year of Highest Degree (% of Teachers)	Years of Experience (% of Teachers)	Gender (% of Teachers)	Age (% of Teachers)
Certificate 6.2 (n = 4)	1969-1993 45.9 (n = 30)	0 - 7 35.4 (n = 23)	Male 55.4 (n = 36)	Under 30 20 (n = 13)
Bachelor's 76.9 (n = 50)	1994-2004 49.3 (n = 32)	8 - 14 ⁺ 64.7 (n = 42)	Female 44.6 (n = 29)	31 - 49 60 (n = 39)
Master's 3.8 (n = 9)				50 - 60 ⁺ 20 (n = 13)
Doctorate 3.1 (n = 2)				

School Size and Location

Size. The categories for school size were: Under 100 students; between 101 and 200; between 201 and 300; between 301 and 400; between 401 and 500; and over 500. The majority of teachers (76.9%) taught in schools with student populations of over five hundred students; two teachers (3.1%) taught in schools with a student count of from 401-500, and 16.9% taught in schools with 301-400 students. One teacher (1.5%) taught in the smallest school with 201-300 students. In reporting on school size it is important to note that there was some redundancy because a number of teachers in the sample were from the same school, with ten of the thirteen schools being represented by from two to ten teachers.

Location. School location was classified according to inner city core (Category 1) or suburban areas surrounding the core (Category 2). Sixty-three of the respondents in the sample described the location of their school. Of these, 53 or 81.5% indicated that their school was in a suburban location, while 10 or 15.4% reported that their school was located in the inner city. Thus the majority of teachers in the sample taught in large suburban schools of over five hundred students and the majority of schools in the study were located in suburban areas.

Subject Areas Taught

Middle years. As indicated in Table 4.7, in the middle years the number of teachers reported teaching Social Studies were as follows: five Geography; eight History; and eleven Science. Thus, a total of 20% of the middle years teachers in the sample taught Social Studies (one or more subjects) and 16.9% taught Science. Two teachers (3.1%) taught a combination of both Social Studies and Science. Twelve teachers (18.5%) indicated that they also taught other subjects in addition to Social Studies and Science.

Senior years. Senior years Social Studies teachers reported teaching the following subjects: five Geography; eight History; and eleven Science. In the Sciences, teachers reported their teaching areas as: Biology (nine); Chemistry (eleven); and Physics (eleven). A total of 52.3% of the senior years teachers taught Social Studies and 47.6% taught the Sciences. There were no teachers teaching a combination of both Social Studies and Science in the senior years. Twenty-one teachers (32.3%) indicated that they also taught subjects outside of Social Studies and Science. It is interesting to

note that one senior years Geography teacher also taught Industrial Arts. (Refer to Table 4.7 for a summary of teaching assignments.)

Table 4.7

Number of Teachers Teaching Social Studies and Science

Social Studies Number and Percentage of Teachers				Sciences Number and Percentage of Teachers				Combination Social Studies and Science
Level in School	Geo graphy	History	World Issues	General Science	Biology	Chemistry	Physics	
Middle Years	5 (7.7%)	8 (12.3%)	-	11 (16.9%)	-	-	-	2 (3.1%)
Senior Years	16 (24.6%)	15 (23.1%)	3 (4.6%)	-	9 (13.8%)	11 (16.9%)	11 (16.9%)	0

The number of teachers teaching the various subjects exceeded the number of possible respondents ($n = 65$). This confirms that teachers were teaching in more than one subject area. While the majority of senior years teachers in the sample had teaching assignments in their major field, they also taught subjects outside of these areas. Middle years teachers taught fewer subjects outside of their major teaching area.

Years Teaching Subject

The same four categories used to describe years of teaching experience were used to describe number of years teaching a subject area: 0 to 3 years; 4 to 7 years; 8 to 13 years; and 14+ years. Data for middle years and senior years teachers were combined for this analysis.

As shown in Table 4.8, the first subject areas identified by teachers in descending order were: History (33.9%); Biology (13.9%); Geography (12.3%); Physics and Science (10.8%); and Social Studies (1.5%), with 29.2% of respondents having taught the subject from 0 to 3 years; approximately half of the teachers (44.7%) having taught that subject from 4 to 13 years; and 24.6% having taught the subject for 14 years or more. Sixty-four teachers responded.

Forty-five teachers indicated teaching a second subject. In descending order, as shown in Table 4.8, these subjects were: Geography (15.4%); Science (13.8%); Math (9.2%), World Issues (4.6%), Language Arts (4.5%); Chemistry and Physics (3%); and French, History, Music, Psychology, Spanish, Social Studies, and Technology (1.5%). Forty teachers responded to the number of years they had taught the second subject area with 16.9% having taught the second subject from 0 to 3 years; 27.7% from 4 to 13 years; and 16.9% for 14+ years.

As indicated in Table 4.8 which follows, fourteen teachers taught a third subject as well, including Language Arts (6.1%); French (3.1%) or Science (3%); with 1.5 percent of the teachers teaching either Chemistry, Computer Science, Math, Physical Education, Special Education or Transitional Education. Thirteen teachers responded to the total number of years they had taught the third subject area: with 6% having from 0 to 3 years of experience, 4% having from 4 to 13 years of experience, while 3% had taught their third subject for 14 or more years.

Table 4.8

Number of Teachers Teaching First, Second and Third Subject Areas

Subjects Currently Teaching					
First Subject Area	% of Teachers	Second Subject Area	% of Teachers	Third Subject Area	% of Teachers
History	33.9	Geography	15.4	Language Arts	6.1
Biology	13.9	Science	13.8	French	3.1
Geography	12.3	Math	9.2	Science	3
Physics	10.8	World Issues	4.6	Chemistry	1.5
Science	10.8	Language Arts	4.5	Computer	1.5
Social Studies	1.5	Chemistry	7	Math	1.5
		Physics	3	Physical Education	1.5
		French	1.5	Special Education	1.5
		History	1.5	Transitional Education	1.5
		Music	1.5		
		Psychology	1.5		
		Spanish	1.5		
		Social Studies	1.5		
		Technology	1.5		

Number of Other Teachers in the Same School Teaching the Same Subject Area

Teachers were asked to indicate the specific subject areas they taught and the number of other teachers in their school teaching the same subjects. Space for three subject areas was provided.

Major subject area. Sixty-five teachers indicated that there were also other teachers in their school teaching the same major subject area (Table 4.9). In descending order of number of teachers teaching the same first subject area were: History (33.9%); Biology (13.9%); Physics (12.3%); Chemistry, Geography, and Science (10.8%); Social Studies (3.1%); and Choral Music, Language Arts and Technology (1.5%). The number of other teachers in the same school teaching this subject (Table 4.10) was from none or only one teacher (35.4%); from two to five teachers (44.7%); and then six or more teachers (18.5%), indicating that in this sample, the number of teachers teaching the same subject area in any one school ranged from one to five.

Second subject area. Teacher responses to a second teaching area in relation to the number of other teachers in the same school teaching this subject were analyzed next (Table 4.9). Second subject areas taught by other teachers were as follows: Geography (15.4%); Science (13.8%); Math (10.8%); Language Arts (7.7%); World Issues (4.6%); Chemistry and Physics (3%); French, Physical Education, History, Spanish and Social Studies (1.5%). Teacher responses indicated the number of other teachers teaching the same subjects (Table 4.10) to be: none or only one (10.8%); from two to five (33.8%); and six or more teachers (18.4%). Forty-one teachers responded. It appeared that in this sample there were a greater number of teachers teaching secondary subject areas than main subject areas.

Third subject area. Finally, thirteen teachers indicated teaching a third subject (Table 4.9) that was also taught by other teachers in their school. These figures were: Language Arts (4.5%); French (3.1%); Special Education (3%); and Chemistry, Computer, Geography, History, Math, Science and Transitional Education (1.5%). The

number of other teachers in the same school teaching the same subjects (Table 4.10) was none or only one (4.6%); from two to five (6.1%); and six or more teachers (9.3%), indicating that considerably fewer teachers either taught the same third subject area or were assigned to teach three different subjects during the school year.

Table 4.9

Number of Same Subjects Taught by Other Teachers in the School

First Subject	% of Teachers	Second Subject	% of Teachers	Third Subject	% of Teachers
History	33.9	Geography	15.4	Language Arts	4.5
Biology	13.9	Science	13.8	French	3.1
Physics	12.3	Math	10.8	Special Education	3
Chemistry	10.8	Language Arts	7.7	Chemistry	1.5
Geography	10.8	World Issues	4.6	Computer	1.5
Science	10.8	Chemistry	3	Geography	1.5
Social Studies	3.1	Physics	3	History	1.5
Choral Music	1.5	French	1.5	Math	1.5
Language Arts	1.5	Phys. Ed.	1.5	Science	1.5
Technology	1.5	History	1.5	Transitional Education	1.5
		Spanish	1.5		
		Social Studies	1.5		

Table 4.10

Number of Teachers Teaching the Same Subjects as the Teacher Respondent

Number of Teachers Teaching Same Subject	% of Teachers		
	First Subject	Second Subject	Third Subject
0 – 1	35.4	10.8	4.6
2 – 5	44.7	33.8	6.1
6+	18.5	8.4	9.3

Overall Summary of Demographic Data

The study sample was made up of more suburban than inner city schools, with the majority of schools numbering over 500 students. The highest academic credential held by the majority of teachers (76%) was a Bachelor's degree, with the highest number of teachers having graduated within the last ten years (1994 to 2004). On the other hand, the majority of teachers in the sample were highly experienced and veteran teachers with approximately 64.7 percent having taught for 8 or more years and only 11 (16.9%) beginning their careers. Sixty percent were between the ages of 31 to 49, with twenty percent being under 30 and another twenty percent being 50 years or older. There were approximately the same number of male (55.4%) as female (44.6%) teachers teaching middle and senior years science and social studies.

Among middle years teachers, there were more teachers teaching Social Studies than Science. In Social Studies, more teachers taught History than Geography. Two teachers reported teaching a combination of both Social Studies and Science, while others also taught other subjects. In the senior years, approximately half of the teachers in the sample taught Social Studies and half taught in the Sciences, with none teaching a

combination of Social Studies and Science. Approximately the same number of teachers taught Geography and History, while a considerably smaller number of teachers taught World Issues. The number of teachers teaching Chemistry and Physics was identical, with a slightly smaller number teaching Biology.

Teachers reported teaching a wider range of second subject areas than first and third subject areas. However, the number of teachers teaching approximately half of these second subject areas was small (1.5%). Teachers had more experience teaching in their first and second subject areas than their third.

The first subject taught by teacher respondents also reflected the greatest number of other teachers who also taught this subject, with up to five teachers teaching the same subject in large schools, which suggests departmentalization and similarity in course content. The number of other teachers teaching the same subject decreased for the second and third subject areas, the third subject being taught by fewer other teachers in the same school.

Predominant Teaching Approach

The next question of interest was to identify the most predominant approach to instruction used by middle and senior years teachers in the sample. The question was: *Do teachers in this jurisdiction use mainly a transmission-lecture, a scaffolded, or a collaborative approach to instruction?* During the analysis, an error was detected in the allotment of items characteristic of transmission (9 items) and collaborative approaches (11 items). To compensate for this mistake, and enable further analysis, mean averages were calculated according to the total number of items associated with each

predominant approach. The specific questionnaire items identifying instructional approaches and concerns are shown in Table 4.11.

Table 4.11

Instructional Approach by Questionnaire Item

Instructional Approach	Questionnaire Items	Total
Transmission	1, 4, 6, 8, 13, 16, 23, 26, 27	9
Collaboration	2, 3, 7, 10, 15, 18, 20, 22, 25, 29, 30	11
Scaffolded	5, 9, 11, 12, 14, 17, 19, 21, 24, 28	10

Relationship Among Instructional Approaches

As illustrated in Figure 4.1, Straw's (2002) model of instructional practices conceptualizes teacher instruction in terms of high-low collaborative practices, along the "Y" axis, and high-low scaffolding practices along the "X" axis.

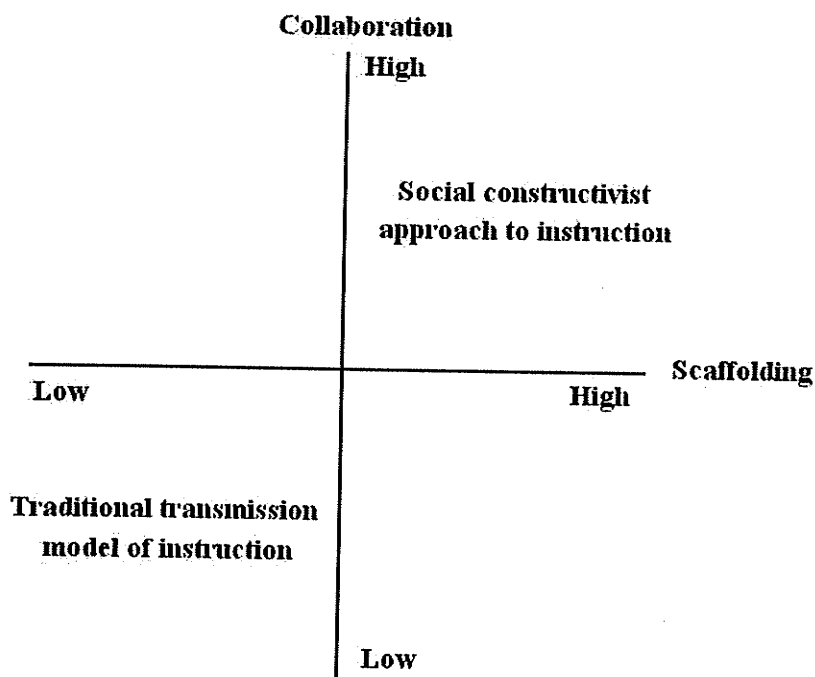


Figure 4.1. Conceptualization of instructional approaches (Straw, 2002).

A two-step cluster analysis that provides for the creation of cluster models simultaneously, based on categorical variables, was then conducted. In this categorical cluster analysis, questionnaire responses greater than 3.5 on the five-point scale were arbitrarily designated as high, and those below 3.5 were considered low. The number of teacher responses falling into high and low categories for each of the teaching approaches were: low scaffolding, 20; high scaffolding, 45; low collaboration, 37; high collaboration, 28; low transmission, 44; and high transmission, 21. As depicted in the following table, no clear pattern emerged.

Table 4.12

Number of Teachers in High/Low Categories for Predominant Teaching Approaches

Predominant Teaching Approach	Low	High
Scaffolding	20	45
Collaboration	37	28
Transmission	44	21

When each variable was combined with every other variable, there were six possible combinations, teachers using high scaffolding, low collaboration and low transmission; low scaffolding, low collaboration, and low transmission; high scaffolding, low collaboration and high transmission; high scaffolding, high collaboration, and low transmission; high scaffolding, high collaboration, and high transmission; and low scaffolding, high collaboration, and high transmission as depicted in Table 4.13.

In a search of Table 4.13 to determine the most salient approach to instruction, Cluster five, high scaffolding, high collaboration and low transmission, representing 27.7

% of participants, emerged as the most predominant, with Cluster three—low scaffolding, low collaboration, and low transmission representing 26.2 % of the sample. The least used combination of instructional approaches was Cluster four, representing a high scaffolding, high collaboration, and high transmission approach made up of 10.8% of the participants. Based on teacher survey response choices, no combination of low scaffolding, high collaboration, and high transmission occurred.

Table 4.13

Results: Categorical Cluster Analysis

	Scaffolding	Collaboration	Transmission	Percent of Participants	Combined Percentage of Participants
Cluster 1	High	Low	Low	13.8	35.3
Cluster 2	High	Low	High	21.5	
Cluster 3	Low	Low	Low	26.2	26.2
Cluster 4	High	High	High	10.8	38.5
Cluster 5	High	High	Low	27.7	
Cluster 6	Low	High	High	0	

These clusters were then examined for patterns in order to identify the most predominant instructional approach used by teachers in this study. Combining clusters four and five, in which the use of transmission varied (high/low) and both high scaffolding and high collaboration were present, seemed logical. This combination accounted for 38.5 percent of teacher responses as shown in Table 4.14 and Figure 4.2. A second pattern that combined clusters one and two also emerged. This combination represented high scaffolding but low collaboration, while at the same time

subsuming elements of transmission to account for 35.3 percent of teacher responses. Cluster three (low scaffolding, low collaboration, and low transmission) remained, accounting for the responses of 26.2% of the teachers.

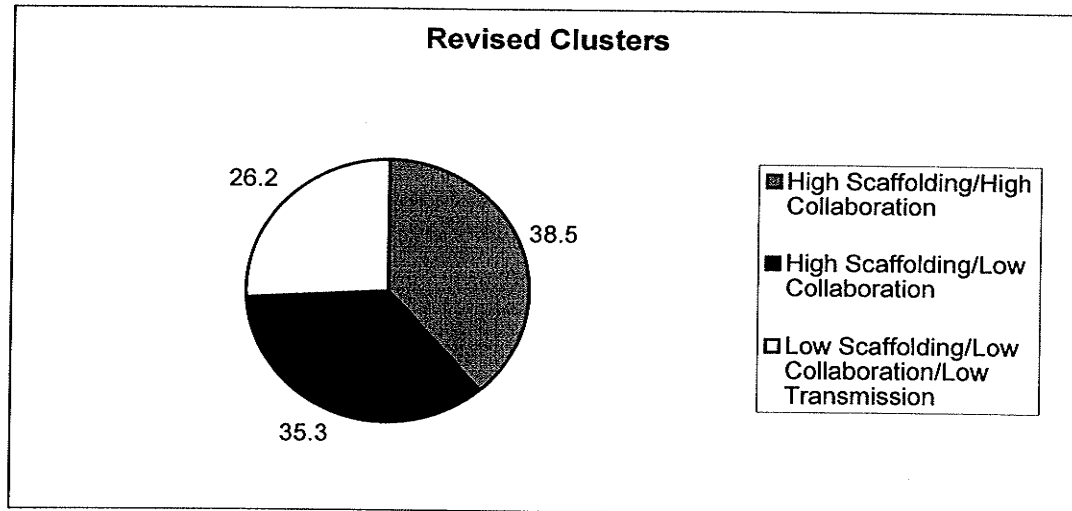


Figure 4.2. Percentage of teachers using scaffolding and collaboration by cluster.

Summary

These findings seem to suggest that instructional approaches may not be so easily distinguished from one another. Combinations of scaffolding, collaboration and transmission seemed to make up the instructional repertoire of teachers in this study. The revised clusters outlining predominant teaching approaches are summarized in Table 4.14.

Table 4.14

Revised Clusters

Clusters	Scaffolding	Collaboration	Transmission	Percent of Participants
Combining 4 and 5	High	High	Both	38.5
Combining 1 and 2	High	Low	Both	35.3
Cluster 3	Low	Low	Low	26.2

In order to confirm responses to the questionnaire items pertaining to instructional approaches, teachers were also asked to identify the five most frequently used teaching approaches or concerns from among the thirty listed in Part B of the survey.

Ranking of Instructional Approaches and Concerns

The third question was: *What are the five most frequently used instructional approaches used by middle and senior years teachers in this study?* The ranking component of the questionnaire invited open-ended responses. As indicated earlier in Table 4.11, survey items 1, 4, 6, 8, 13, 16, 23, 26 and 27 pertained to the use of a transmission approach, items 2, 3, 7, 10, 15, 18, 20, 22, 25, 29 and 30 to collaboration, and items 5, 9, 11, 12, 14, 17, 19, 21, 24, and 28 to a transmission approach. (See coded items, Appendix A.) Fifty-six teachers responded to this part of the questionnaire. Frequency counts were used to determine the number of times each instructional approach/teaching concern was identified by respondents. To take into account items

that fell into the same rank order, all items within that rank were assigned an average rank.

A discussion of findings (Summarized in Table 4.15) follows beginning with the items ranked most often. The most often used instructional approach cited by teachers was the use of testing at the end of each unit or textbook chapter, categorized as a transmission item. The second most often used approach was teachers moving around classrooms to provide help to students as they worked (scaffolding). The lecture format (presenting information on the overhead or by power point) was ranked third as a popular instructional strategy (transmission). Fourth, teachers had students work together collaboratively in small groups (collaboration).

A number of approaches and concerns occupied the next ranking which was averaged over four items. Teachers: (1) had students carry out projects or activities that related to the real world (posters, brochures, oral presentation, and debates—categorized as collaboration.); (2) prompted students during oral discussion to clarify their understanding; (3) provided tips for learning and remembering; and (4) supplied overviews of new content, the last three all being associated with scaffolding learning. The next most highly—rated item (ninth according to the averaged rankings) was to give students opportunities to discuss their knowledge, ideas, and questions (collaboration). Ranked tenth was providing students with time to talk and share their ideas in groups (collaboration). The eleventh most highly rated item was teacher use of rubrics or a scale to grade student work (scaffolding).

Table 4.15

Teacher Ranking of Instructional Approaches and Concerns

Rank Order By Use/or Concern	Teacher Responses (Percentage)	Approach/Teaching Concern (Form B)
1	8.7	Testing at the end of each unit or textbook chapter
2	7.6	Circulate around classroom to provide help to students as they work
3	6.9	Use the lecture format to present information via the overhead or power point
4	5.8	Have students work together collaboratively in small groups
6.5	5.4	Have students do projects or activities that relate to the real world (posters, brochures, oral presentations, debates, etc.) Teachers prompt students during oral discussion to clarify their understanding Teach tips for learning and remembering to help students read and remember Teachers provide students with an overview of the new content they will study
9	5.1	Give students opportunities to discuss their knowledge, ideas, and questions
10	4.7	Give students time to talk and share their ideas in groups
11	4.0	Use of rubrics or a scale to grade student work
12.5	3.6	Teachers use graphic organizers in the form of charts or maps to help students focus on key concepts and supporting details Have students copy notes from the board or overhead Teachers are concerned about covering curriculum content
14	3.2	Use a variety of print materials to teach the concepts in their content areas including tradebooks, newspaper articles, and pamphlets
15.5	2.9	Find out what students know about a new topic or unit before they begin Encourage students to consider divergent points of view
18	2.5	Have students work independently on end-of-chapter questions or worksheet questions Provide opportunities for students to explain or demonstrate their understanding to the rest of the class Teachers collaborate with other teachers in the school to develop lesson plans or units of study
20	1.8	Encourage students to self-select their own topics for research and inquiry
21	1.4	Instruct students on comprehension strategies to process text Teachers are involved in subject area teams for curricular planning
22.5	1.1	Textbooks are used as the major focus of study Teachers work with students in small groups
26	0.4	Teacher informs student when there are difficulties or inconsistencies within the text Group students according to their ability level Prefer students to maintain a quiet working environment Arrange student desks to reduce the amount of student talk

A number of approaches and concerns shared the next ranking, which averaged over three items ranked 12.5. Teachers: (1) used graphic organizers in the form of charts or maps to help students focus on key concepts and supporting details (scaffolding); (2)

had students copy notes from the board or overhead (transmission); and (3) indicated concern about covering curriculum content (transmission). Fourteenth, teachers used a variety of print materials to teach the concepts in their content areas including trade books, newspaper articles, and pamphlets (scaffolding). Occupying the averaged ranking of 15.5 were two items. Teachers: (1) found out what students already knew about a new topic or unit before they began; and (2) encouraged students to consider divergent points of view, both of which were categorized as being related to collaboration. There were three items ranked according to average in eighteenth place. Teachers: (1) had students work independently on end-of-chapter questions or worksheet questions (transmission); (2) provided opportunities for students to explain or demonstrate their understanding to the rest of the class; and (3) they themselves collaborated with other teachers in the school to develop lesson plans or units of study, the latter two both being listed under collaborative approaches. Based on averaged rankings, the twentieth ranked item was to encourage students to self-select their own topics for research and inquiry, which involved scaffolding.

Two items were ranked in the twenty-first averaged position. Teachers: (1) instructed students on comprehension strategies to process text (scaffolding); and (2) were involved in subject area teams for curricular planning (collaboration). Two items fell into the ranking of 22.5: (1) the use of a textbook as the major focus of study (transmission); and (2) students working in small groups (collaboration). Finally, three items were ranked in the twenty-sixth averaged position. Teachers: (1) informed students when there were difficulties or inconsistencies in the text (scaffolding), (2) grouped

students according to their ability level (scaffolding), (3) preferred a quiet working environment (transmission); and (4) arranged desks to reduce student talk (transmission).

It is interesting to note from a perusal of Table 4.15 that of the 56 participants who responded to the open-ended section of Form B and ranked each questionnaire item, only 8.7%, less than one in ten indicated that they tested at the end of each chapter or unit of study. Only 7.6% circulated around the classroom, and only 6.9% presented information on the overhead or through powerpoint presentations. Such low figures may be the result of too few teachers having to choose from among too many items (30), thus dispersing the findings.

Summary

It is interesting to note from the descriptive analysis that all but one of the 30 items were selected by at least one teacher either as an instructional approach or as a teaching concern. The one that was not selected by any of the teachers was item 16: "Have students work independently when reading and writing." Analysis of teacher responses resulted in a total of twenty-six ranking positions. The four most frequently used instructional approaches used by the middle and senior years teachers in this study were: assessing content knowledge through end of unit or chapter tests, providing individual support as students worked on assigned tasks, lecturing—assisted by overhead or power point presentations, and having students work collaboratively in small groups. Four approaches fell into the averaged ranking of 6.5. These included: assigning projects, prompting during whole class discussion, providing metacognitive tips to aid learning and remembering, and using structured overviews at the beginning of a unit of study. These responses suggest that teachers in this sample were using a mixture of instructional

approaches (scaffolding, collaboration, and transmission) as conceptualized by the Straw (2002) model (Figure 4.1).

This descriptive analysis of instructional approaches supported the statistical analysis that showed teachers employed a mixture of instructional approaches including scaffolding, collaboration, and transmission to facilitate teaching and learning.

Cognitive Text-Processing Strategies

The fourth major question, *What is the nature of use of the cognitive text-processing strategies (before reading, during reading, and after reading)* was explored next. Frequency counts were used to determine the nature of teacher use of specific before, during, and after reading cognitive text-processing strategies as assessed in Part C of the questionnaire. Teacher responses were recoded in terms of “used the strategy” (Likert responses 3 to 5) and “Did not use the strategy” (Likert responses 1 and 2). Responses to Category 6, “not familiar with” were recoded to Category 1 “never use” to increase the strength of the analysis. A person not familiar with an item would not use it.

Before Reading

Before reading strategies used most often by participating teachers were (See Table 4.16): activating and building background knowledge; using analogies to move from the familiar to the unfamiliar; questioning to focus reading; identifying the purpose for reading; and predicting. The following strategies were used some of the time: previewing text titles, subheadings, illustrations, charts and graphs; pre-teaching vocabulary; and having students themselves identify unfamiliar words. Strategies used approximately fifty percent of the time included: advance organizers and think-alouds. Teachers were least likely to use anticipation guides before assigning reading.

Table 4.16

Before Reading Strategies in Order of Use

Item Number	Strategy	Percent Used	Percent Not Used	N
2	Activate and build background knowledge.	95.4	0.0	62
3	Use analogies to move from the familiar to the unfamiliar.	93.8	3.1	63
5	Use questions to focus reading	87.7	7.7	62
8	Identify the purpose for reading	81.5	15.4	63
6	Use predicting	80.0	15.3	62
9	Preview text titles, subheadings, illustrations, charts, graphs, etc.	76.9	20.0	63
1	Pre-teach vocabulary	72.5	24.6	63
11	Have students themselves identify unfamiliar words	67.6	29.3	63
4	Use advance organizers	55.3	41.6	63
7	Use think-alouds	46.2	50.7	63
10	Use anticipation guides	35.4	61.5	63

During Reading

Teachers most often used during reading questions to guide student understanding are shown in Table 4.17. During reading strategies often included: questioning to guide reading, the use of summaries, visual imagery, note taking, study guides, strategies for clarifying ideas, and outlining. Cognitive test-processing strategies used approximately fifty percent of the time were: K-W-L (Know-Want to Know-Learned), use of self-generated questions, guided reading, self-monitoring strategies, construction of semantic or mind maps, text structure, and sentence combining or sentence reduction. Reciprocal teaching, D-R-T-A (Directed Reading Thinking Activity), and questioning the author were included in teacher instruction less than half the time and semantic feature analysis was least employed.

After Reading

The after reading strategy used most often by teachers was providing feedback to student responses (Table 4.18). Other strategies used some of the time were: having students write about their understanding; using the compare contrast framework; and writing for recall, extension, or application. Teachers used the following strategies approximately half of the time: peer response groups, the jigsaw strategy, and inquiry groups. The fishbowl technique was rarely used by the participating teachers in this study.

Table 4.17

During Reading Strategies in Order of Use

Item Number	Strategy	Percent Used	Percent Not Used	N
13	Use questions to guide reading	86.2	9.2	62
25	Teach summarizing	76.9	20.0	62
12	Encourage use of visual imagery	72.3	21.6	63
29	Teach note taking	67.7	29.3	61
23	Use study guides	64.6	29.2	63
27	Teach strategies for clarifying ideas	64.6	30.8	61
28	Teach outlining	63.0	33.9	62
18	Use K-W-L (Know-Want to Know-Learned)	53.9	41.5	63
14	Teach the use of self-generated questions	50.8	46.2	62
20	Use guided reading	50.8	44.7	63
15	Teach self-monitoring strategies	49.2	46.2	62
16	Construct semantic or mind maps	44.7	50.7	62
24	Teach text structures	40.1	52.3	62
26	Teach sentence combining or sentence reduction	40.0	55.3	60
21	Use reciprocal teaching	38.5	55.3	62
19	Use DRTA (Directed Reading Thinking Activity)	29.2	64.6	61
22	Use "Questioning the Author"	24.6	70.7	61
17	Use semantic feature analysis	20.0	75.4	62

Table 4.18

After Reading Strategies in Order of Use

Item Number	Strategy	Percent Used	Percent Not Used	N
31	Provide feedback to student responses	84.6	12.4	63
30	Have students write about their understanding (learning logs, admit and exit slips)	76.9	20.0	63
35	Use compare contrast framework	76.9	18.5	62
34	Use writing for recall, extension, or application	63.1	33.8	63
32	Use peer response groups	56.9	38.5	62
36	Use the jigsaw strategy	49.2	47.7	63
33	Use inquiry groups	41.5	53.8	62
37	Use the fishbowl technique	15.3	81.6	63

Summary

The most often used before reading strategies according to the descriptive data analysis were activating or building background knowledge and using analogies. The most often used after reading strategy was providing feedback, while the most frequently used during reading instructional strategy was using questions to guide reading. Anticipation guides, semantic feature analysis, and the fishbowl technique were seldom used as instructional strategies to enhance text processing.

The Use of Cognitive Text-Processing Strategies Before, During, and After Reading

Next, question five asked, *Were there statistically significant differences in the frequency with which cognitive text-processing strategies were used before, during, and after reading?* In order to reduce measurement error, the analysis of this question was combined with the analysis of question six that asked whether there were any statistically significant relationships between predominant approach to instruction and the use of cognitive text-processing strategies (before, during, and after reading).

These questions were explored by conducting a two-way analysis of variance with repeated measures using the major instructional approach clusters as the between subjects variable, and before, during and after reading strategies as the repeated measures variable, followed by multiple comparisons using the Bonferroni approach to explore differences among each of the levels of both independent variables.

Cognitive Text-Processing Strategies (Before, During, and After Reading)

There was a total of 37 comprehension strategy items, 11 related to pre-reading, 18 related to during reading, and 8 related to after reading (Questionnaire, Form C). Three before, during, and after reading variables were created by taking the average of the strategy items associated with pre-reading (Items 1 to 11), during reading (Items 12 to 29), and after reading (Items 30 to 37). Findings from the two-way analysis of variance are reported in the accompanying Table (4.19).

Table 4.19

Anova Table for Relationship Between Cognitive Text-Processing Strategies (Before, During, and After Reading) and Clustered Instructional Approaches

	df	Mean Square	F	p
Instructional Approach Cluster	2	4.004	5.454	.007*
Error	54	.734		
Time (before, during, after)	2	7.280	3.965	.000*
Time X Cluster	4	.174	.812	.520
Error	108	.214		

*denotes significance

Pairwise comparisons employing the Bonferroni adjustment while at the same time considering instructional approach clusters (high-scaffolding-high collaboration, high scaffolding-low collaboration, and low-scaffolding-low collaboration) revealed that before reading instructional strategies were employed significantly more often than both during and after reading strategies ($p < .001$). There were, however, no statistically significant differences between during and after reading strategies ($p = .095$). This finding approached significance, with after reading strategies being used more often than during reading strategies. Thus the use of before reading instructional strategies was greater than the use of both during and after reading instructional strategies.

*Predominant Teaching Approach in Relation to the
Use of Cognitive Text-Processing Strategies*

As indicated previously, in order to reduce measurement error the analysis of questions five and six was combined using a two-way analysis of variance with repeated measures to determine the relationship between predominant teaching approach and use of cognitive text-processing strategies. Question six asked, *Were there any statistically significant differences among instructional approach clusters when all three (before, during, and after reading) cognitive text-processing strategies were considered?* As indicated, the analyses for Question 5 and Question 6 were collapsed into a single analysis. (See Table 4.19.)

As indicated in Table 4.19, which is repeated again on the next page, the two-way analysis of variance with repeated measures revealed significant statistical differences among the patterns of instructional approaches (high scaffolding-high collaboration with transmission; high scaffolding-low collaboration with transmission; and low scaffolding-low collaboration-low transmission) ($F(2,54) = 5.454, p < .007$) in relationship to the use of pre-, during, and after reading instructional strategies ($F(2,54) = 3.965, p < .001$).

The respective means and standard deviations were before reading: for high scaffolding-high collaboration with transmission ($M = 3.43$, $SD = .61352$), high scaffolding-low collaboration with transmission ($M = 3.29$, $SD = .44269$), and low scaffolding-low collaboration-low transmission ($M = 2.97$, $SD = .36625$); during reading: high scaffolding-high collaboration with transmission ($M = 2.82$, $SD = .58029$), high scaffolding-low collaboration with transmission ($M = 2.42$, $SD = .70228$), and low scaffolding-low collaboration-low transmission ($M = 2.30$, $SD = .54178$); with the means and standard deviations for after reading: for high scaffolding-high collaboration with transmission ($M = 3.07$, $SD = .77559$), high scaffolding-low collaboration with transmission ($M = 2.58$, $SD = .49816$), and low scaffolding-low collaboration-low transmission ($M = 2.49$, $SD = .85917$).

Table 4.19

Anova Table for Relationship Between Cognitive Text-Processing Strategies (Before, During, and After Reading) and Clustered Instructional Approaches

	df	Mean Square	F	<i>p</i>
Instructional Approach Cluster	2	4.004	5.454	.007*
Error	54	.734		
Time (before, during, after)	2	7.280	3.965	.000*
Time X Cluster	4	.174	.812	.520
Error	108	.214		

*denotes significance

There were no statistically significant interactions among before, during, and after reading cognitive text-processing strategies and patterns of instructional approaches (F

(4, 108) = .812, $p = .520$) indicating that the pattern of before, during, and after reading is the same for all approach clusters. These findings are depicted in Figure 4.3 in which it is apparent that the same patterns from each of the teaching approaches exist across time (before, during, and after reading strategies) and instructional approaches (high scaffolding-high collaboration with transmission; high scaffolding-low collaboration with transmission; and low scaffolding-low collaboration-low transmission). Findings from the follow-up tests using the Bonferroni adjustment showed that there were statistically significant differences between high scaffolding-high collaboration and low scaffolding-low collaboration ($p < .01$).

One may question why teachers who rated high on high scaffolding/low collaboration used relatively low levels of before, during and after reading strategies which inherently involve scaffolding. One explanation might be that these results are an artifact of the questionnaire. Form B that focused on instructional approaches examined scaffolding in terms of monitoring learning, prompting and circulating around the room and assisting students as they worked, while Form C defined scaffolding in more concrete before, during, and after reading terms .

Summary

Teachers reporting use of high scaffolding and high collaboration regardless of transmission (Clusters four and five combined) employed instructional reading strategies more often before reading, during reading, and after reading than teachers whose reported teaching approaches were high scaffolding-low collaboration, regardless of transmission (Clusters one and two combined) and low scaffolding-low collaboration-low transmission (Cluster 3).

Relationship Between Predominant Teaching Approach and Demographics

The following demographic characteristics of the sample population were selected for analysis: level of education (highest educational credential), year of graduation, years of teaching experience (early in career: 0-7 years; later in career: 8-14+ years), gender, and age. The remaining demographics were not included in the analysis since either the sample size for the various sub-categories was small or the relationship seemed inconsequential (subject area taught, years teaching that subject, number of other teachers in that subject area in the same school, school location, number of students in the school).

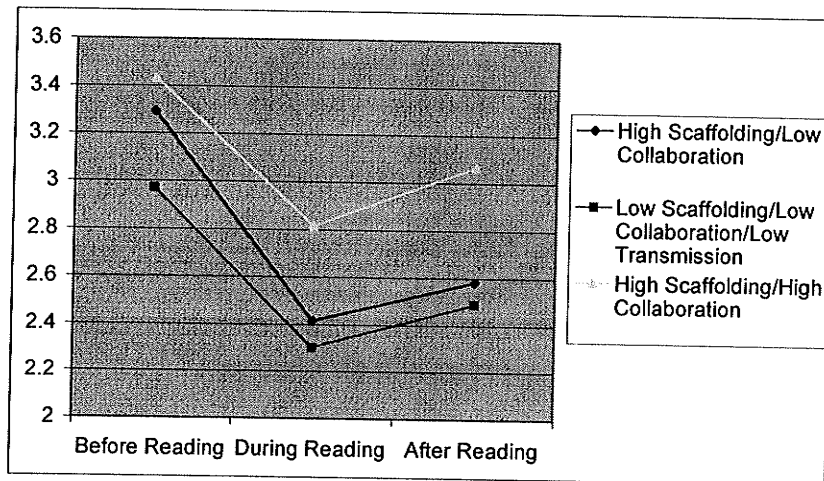


Figure 4.3. Predominant teaching approach in relation to the use of cognitive text processing strategies.

A cross-tabulation analysis was carried out to explore the relationships between clusters (high scaffolded-high collaboration; high scaffolded-low collaboration; and low scaffolded- low collaboration-low transmission). A Pearson Chi-square analysis was employed to assess whether there were any significant relationships between the demographic categories and the cluster categories. Findings indicated that there were no

statistically significant relationships between any of the instructional clusters and any of the demographic variables (See Tables 4.20, 4.21, 4.22, 4.23 and 4.24).

Table 4.20

Relationship Between Instructional Approach Cluster and Highest Educational Credential

Highest Educational Credential	Cluster Groups			
	High Scaffolding, High Collaboration	High Scaffolding, Low Collaboration	Low Scaffolding, Low Collaboration	Total
Undergraduate	11	12	9	32
Graduate	14	8	6	28
Total	25	20	15	60

$$\chi^2(2) = 1.5, p = .472$$

Table 4.21

Relationship Between Instructional Approach Cluster and Year of Graduation

Year of Graduation	Cluster Groups			
	High Scaffolding, High Collaboration	High Scaffolding, Low Collaboration	Low Scaffolding, Low Collaboration	Total
1994-2004	11	12	9	32
1964-1993	14	8	6	28
Total	25	20	15	60

$$\chi^2(2) = 1.5, p = .47$$

Table 4.22

Relationship Between Instructional Approach Cluster and Years of Teaching Experience

Teaching Experience	Cluster Groups			
	High Scaffolding, High Collaboration	High Scaffolding, Low Collaboration	Low Scaffolding, Low Collaboration	Total
Early in career	7	10	6	23
Later in career	19	10	10	39
Total	26	20	16	62

$$\chi^2(2) = 2.58, p = .275$$

Table 4.23

Relationship Between Instructional Approach Cluster and Gender

Gender	Cluster Groups			
	High Scaffolding, High Collaboration	High Scaffolding, Low Collaboration	Low Scaffolding, Low Collaboration	Total
Female	12	9	7	28
Male	14	11	9	34
Total	26	20	16	62

$$\chi^2(2) = .023, p = .988$$

Table 4.24

Relationship Between Instructional Approach Cluster and Age

Age	Cluster Groups			
	High Scaffolding, High Collaboration	High Scaffolding, Low Collaboration	Low Scaffolding, Low Collaboration	Total
Under 30	5	6	2	13
31-49	7	7	5	19
50+	13	7	9	29
Total	25	20	16	61

$$\chi^2(4) = 2.51, p = .643$$

Relationship Between Cognitive Text-Processing Strategies and Demographics

The same demographic characteristics were examined in relation to before, during, and after text-processing strategies. The data were analyzed employing a one-way between subjects analysis of variance with each level of cognitive text-processing strategies (before, during, and after) as the dependent variable and demographic categories as the independent variables. No significant relationships were found between before, during, and after reading strategies and the five demographic characteristics (level of education/highest educational credential, year of graduation, years of teaching experience, gender and age). These findings are illustrated in Tables 4.25, 4.26, 4.27, 4.28 and 4.29.

Table 4.25

Relationship Between Cognitive Text-Processing Strategies and Highest Educational Credential

	Cognitive Text-Processing Strategies	N	Mean (stand dev)	df	F	<i>p</i>
Highest Credential	Pre-reading	60	3.309 (.54832)	2,59	.276	.843
	During reading	63	2.565 (.65927)	2,62	.271	.846
	After reading	63	2.774 (.65927)	2,62	.585	.627

Table 4.26

Relationship Between Cognitive Text-Processing Strategies and Year of Graduation

Year of Graduation	Cognitive Text-Processing Strategy	N	Mean (stand dev)	df	F	p
	Pre-reading	57	3.301 (.55195)	2,56	1.724	.195
	During reading	60	2.547 (.66524)	2,59	.284	.596
	After reading	60	2.732 (.72480)	2,59	.5585	.447

Table 4.27

Relationship Between Cognitive Text-Processing Strategies and Years of Teaching Experience

Teaching Experience	Cognitive Text-Processing Strategy	N	Mean (stand dev)	df	F	p
	Pre-reading	65	3.309 (.54832)	2,59	.80	.488
	During reading	65	2.565 (.65927)	2,62	.589	.624
	After reading	65	2.774 (.74184)	2,62	.803	.497

Table 4.28

Relationship Between Cognitive Text-Processing Strategies and Age

Gender	Cognitive Text-Processing Strategy	N	Mean (stand dev)	df	F	p
	Pre-reading	60	3.309 (.54832)	2,59	.606	.440
	During reading	63	2.565 (.65927)	2,62	.004	.951
	After reading	63	2.774 (.74184)	2,62	.376	.542

Table 4.29

Relationship Between Cognitive Text-Processing Strategies and Gender

	Cognitive Text-Processing Strategy	N	Mean (stand dev)	df	F	<i>p</i>
Age	Pre-reading	58	3.287 (.54247)	2,57	.489	.616
	During reading	61	2.573 (.64339)	2,60	.104	.901
	After reading	61	2.762 (.73410)	2,60	1.074	.348

Summary

Teaching approaches were not related to highest educational credential, year of graduation, years of teaching experience, gender or age. Neither was teacher use of cognitive text-processing strategies related to the same five demographic characteristics.

Findings from the Interviews—Part 2: Qualitative

To add to survey findings and provide further insight into teaching practices and challenges, ten teachers with an instructional approach that involved predominantly high scaffolding, high collaboration, or a combination of the two as identified by the questionnaire were interviewed. To be rated as high, a survey response fell into the category as either four (“often” use) or five (“very often” use) for items designated as scaffolded and collaborative approaches on Form B on the questionnaire. (See Appendix A.)

Each of the one-hour interview audio tapes was transcribed and then analyzed through the use of a grounded theory approach (Glaser & Strauss, 1967) and the constant comparative method by searching for emerging themes that were coded and compared to

identify recurrent patterns. This required making repeated searches through the data. The guiding research questions for Part 2 of the data analysis were:

9. Are there common, shared characteristics between teachers who use social constructivist approaches in their teaching?
10. What do the instructional programs of teachers using social constructivist practices look like?
11. What do content area teachers perceive as their concerns and challenges?
12. Is there sufficient support from the division and school level to fulfill teachers' professional development needs?
13. How do teachers perceive their workplace environment in terms of curricula, timetabling, class size, and composition?
14. What do teachers know about their adolescent students that informs their instruction?

The themes that emerged from analysis of the data are discussed next.

Themes

Repeated searches through the interview data revealed a number of main and sub-themes as shown in Figure 4.4. These themes represented both the theoretical beliefs and teaching practices of teachers using social constructivist approaches (scaffolding and collaboration) to facilitate teaching and learning. The main themes that emerged emphasized teacher knowledge and beliefs, instructional practices, assessment and the challenge of time, and adolescent culture. The overall theme of teacher knowledge and beliefs about teaching and learning and its related sub-themes is discussed first.

A. Teacher Knowledge and Beliefs about Teaching and Learning

Subject Area Competence

The majority of teachers interviewed expressed the feeling of being knowledgeable and feeling competent about their subject area, with most having studied their teaching subject at university. Several believed that their academic background enabled them to access discipline knowledge easily and to identify the major concepts related to the curriculum they were teaching. These teachers explained how major concepts were the focus of their teaching. For instance, one social studies teacher measured students' ability to discuss key concepts as a way to determine their understanding of the unit. He did this by conferencing with students individually and asking, "What did you learn?" He stated, that "if [students] grasp the overall concepts and the meat of something" then the unit had been a success.

Although most teachers interviewed had studied their major teaching areas at university, in the next example a teacher described how she worked to develop competence in a subject area that had not been part of her university studies. This middle years teacher was asked to teach science, a subject that she had never taught before and, in fact, carried negative recollections about based on her own schooling. She explained,

So, I hated science at school. I was taught, usually experiment ... watch it happen.

All you did was copy the notes down and do a drawing. And I hated science. It was so boring. So when I started to teach, I didn't want to teach science at *all*. I can't teach science. I don't know science. I teach from my own personal comfort knowledge base and that's how I teach ... if I don't feel comfortable with the content area, I feel that I don't really teach well.

She indicated that she spent the summer studying the textbook and curriculum to become knowledgeable about the content in order to enable her to teach science in an exciting way, "So that summer, I went home and I studied. And I studied science, so that I got a real strong feel for it. And it became one of my favourite subjects to teach."

Teacher as Learner

Keeping current. All of the teachers discussed ways in which they actively sought to increase and update their knowledge and understanding of their subject area and were continually in search of new ways to teach. Teachers reported that they regularly accessed the worldwide web for this purpose which kept them current and knowledgeable about their discipline area and helped them connect curricular concepts to current issues. One social studies teacher explained how he prepared for a unit on politics by focusing on the political parties running in an upcoming election.

So ... for me, it was to go to the various sites and really do the research in advance and know what's out there and to present it to the kids. ... So at home I often go online and before I do a research topic [with the students] I try and attack it from a variety of angles so I do the ground work before hand.

While this particular teacher conducted searches on a variety of topics in order to offer students a choice, he also carried out online searches to accommodate students who had requested to research topics other than those he had provided. For example, one student requested permission to write his research paper on a fifth party.

I [had] a student say, "I want to do the marijuana party. ... It's one of the eight fringe parties, can I do that?" And if I don't know much about it ... Then I'll sniff around [to learn more about it]

A. Teacher Knowledge and Beliefs About Teaching and Learning

- Subject Area Competence
- Teacher as Learner
- Professional Development
- Student Engagement
- Encouraging Student Autonomy and Initiative
- Scaffolding Instruction
- Differentiated Instruction
- Innovation

B. Instructional Practices

- Flexibility and Creativity
- Planning
- Fostering Choice and Autonomy
- Projects, Activities, and Assignments
- Transitioning from a Lecture Format
- The Role of Textbooks
- Moving Beyond Textbooks
- Study Notes
- Teaching Text Structure
- Teaching Metacognition
- Group Collaboration
 - Homogeneous learning groups
 - Heterogeneous learning groups
 - Challenges in using collaborative groups
 - Group size

C. Assessment and the Challenge of Time in Teaching Content Area Subjects

- Testing
- Rationale
- Variations in Testing
- Unconventional Testing
- Rubrics
- Peer Assessment
- Teacher Accountability
- Grades
- Parental Demands
- Time in Relation to Instructional Approaches
- Constructivist Approaches Versus Traditional Approaches
- Student-Centred Focus in Relation to Time
- Time Efficiency and Cross-Curricular Timetabling
- Limited Opportunities for Teachers to Meet
- Extra-Curricular Responsibilities
- Timetabling
- Time Required for Activity-Based Learning

D. Adolescent Culture

- Student Achievement
 - Background and placement
 - Classroom size and make-up
- Issues of Adolescence
 - Part-time jobs
 - Workload
 - Time
 - Dropping out
 - Support services
 - Attendance policies

Figure 4.4. Themes and related sub-themes.

accessed the worldwide web for this purpose which kept them current and knowledgeable about their discipline area and helped them connect curricular concepts to current issues.

A number of teachers found the worldwide web an important source of up-to-date content information. One history teacher reported that she regularly goes on-line for up-to-date statistical information.

Two teachers, one who taught geography and the other social studies, both stated that they wanted to keep their instructional program interesting for their students as well as for themselves. The social studies teacher explained, "I try to do a variety of things and when I notice myself getting into a bit of a rut, I try to change it and mix things up, because nothing's worse than having a boring teacher and unexciting lessons, you know." A geography teacher noted that she aims to make her instructional program, "... meaningful to the students. It gets boring to do the same thing all the time."

The English Language Arts department was valued by several teachers who sought support in implementing literacy strategies into their content area subjects. One teacher explained how the English Language Arts program has been a source of support in her instructional program,

... where I heard about ... reciprocal teaching and questioning the author? I think mostly from our English teachers is where I got it. Because you hear them talking about what they do, and it sounds like a lot of fun. And sometimes the kids will bring it up as well. ... I picked it up from my colleagues. And we share. I went down to the English department ... So I said could you give me your rubrics for research projects, and she did. Then I just modified it for the bio class.

Teachers also e-mailed other teachers in their field in an effort to acquire new ideas that had been already piloted. One biology teacher explained,

You see I have so many contacts, people in the States. I have so many contacts that are Bio teachers, and we exchange labs still. We get online, we phone each other up.

Another teacher talked about how important it had been to her teaching to connect with other teachers in the different provinces in which she had taught. She talked in terms of how her own learning had been facilitated by talking to others and sharing materials and ideas.

Professional Development

The provincial government mandates that ten days are allocated for a combination of professional development and administrative days over the school year with each school division being responsible for planning and scheduling these days. Several teachers stated that the professional development planning in their schools and divisions was often not in line with their current needs or interests. These teachers found that the development of their professional interests had been achieved through their own self-directed study, through (1) networking with others in the field, from both within and outside of the school division, and (2) self-initiated investigations to seek knowledge in areas of personal teaching interest. Discussion with teachers about professional development revealed that it falls into two areas.

The first was personal professional development. Teachers who were lifelong learners continue to pursue knowledge in their content area and update their professional knowledge about teaching and learning on an ongoing and self-inquiring basis. When

asked how they were able to keep current with best practices and new teaching strategies all of the interviewed teachers indicated that they pursued these initiatives on their own.

Comments from teachers included:

- “The division does offer some things but generally I do most of the things on my own.”
- “I would say [my professional development is done] on my own ... more than in the school. It’s not that the in-servicing in the school ... it usually revolves around other things and so yeah, I’m doing it on my own.”

Sometimes teachers sought to improve competence in an area through some form of organized professional development. For instance, one teacher explained how she attended a conference to become better at supporting struggling high school readers,

I was running into students who really couldn’t read and I didn’t know anything as a high school English teacher about decoding or any of that, and so that’s where my interest lay. I guess a couple of years ago the division offered ... a later literacy training program and I went along with our resource teacher and one learning assistant and that kind of started me on a roll.

In some school divisions, professional development days included time for teachers to pursue their own areas of interest. Teachers reported various ways divisions provided for this. In one school division, teachers have two half days for individual professional development. One teacher stated, “It can be used in any way like ... I did a visitation to [another high school] last time.” In some school divisions teachers can request time away to attend a workshop or conference with the provision of a substitute and funding. One teacher stated, “In the last, I’d say four years or so ... I’ve been kind of

focusing in on reading and literacy strategies. And this has been my own interest and so I've probably gone to eight work-shops and talked to different people you know that kind of thing."

A second area of professional development involved whole-school or divisional programming initiatives. These were usually initiatives determined by the division, school administrators or the school professional development committee. The focus of this type of professional development was an administrative-driven, systemic approach targeted for the entire school or division. Some teachers preferred this type of divisional in-servicing over in-services that focused on a specific instructional approach which teachers may or may not value. One teacher explained,

Yes, often the divisional ones are set by the division and sometimes they will say here's the broad topic for schools. You know and you do it at your school, but it has to be around this whatever it is ... Well, I might be the wrong person to ask because I'm the chair of our steering committee, we call it the school improvement team so often [with] any school based PD, we will generate [ideas] around our school goals which are not necessarily connected to whatever we are individually doing. In theory it would be good if all our individual goals would lead into the school plan, but it doesn't always work out that way so I find them useful to the school. I'm not sure they always are useful to me in my classroom, but I am the wrong person to ask because I have a lot to do with controlling what that is (laughs).

One teacher believed that whole school initiatives rather than specific teaching and learning approaches had more potential for implementation because of the collegial

support available and follow-up in-servicing to revisit the new plan. She elaborated on her perspective this way,

... they are more encompassing for every individual in the school. When they [professional development in-services] somehow drift into more individualized teaching strategies or what have you, I think they get lost, because then some people go, "I'm not interested ... it doesn't apply to me." Then it's not taken back into your classroom and nothing is done with it because it wasn't initiated by you, so I'm not sure that they are as useful.

This teacher stated, though, that even whole school or divisional in-servicing required revisiting a new initiative and follow-up to make it part of regular practice. She explained,

unless ... we say okay the whole school ... we are going to work on this and we have PD and then we have a follow-up, then we have a follow-up and a follow-up, it's kind of pointless. ... Everybody needs to buy in and then it has to be a continued ... measured ... kind of constant effort to be using and implementing and talking about ... Otherwise it gets lost and it's just another in-service.

Beliefs about teaching and learning, the second major theme, are discussed next.

Student Engagement

The prevailing belief among interviewed teachers was the need to facilitate learning by helping students connect to the content in personally meaningful ways. A history teacher explained it this way, "We need to tap into ways students make connections." Teachers consciously planned activities that would engage students in working with the content in ways that reflected real-world applications. Teacher

descriptions and explanations of their lessons, activities, and projects revealed deliberate planning to engage student interest and facilitate active thinking and involvement with the concepts they were teaching. This theme is connected to the previous theme regarding subject area knowledge in that it suggests that a strong content area knowledge base frees the teacher to focus on the students as learners.

Being knowledgeable about the major concepts within each topic, teachers focused their attention on ways to help students connect with these ideas. One teacher indicated that she “go[es] with the big concepts, and see[s] what comes out of it.” She talked about having the students write notes, but as “memory joggers” and not in the traditional sense. She explained, “If they need to study, they need to take notes to remind themselves. But if they really enjoyed what they were doing, a jog of the memory will be ... the note will be a jog of the memory, [of what they learned].” She went on to say, “If he’s learned it, he’s learned it. And he’ll hold onto it. I think that’s a big aspect of it too. If we only test pencil and paper, the kids will only remember long enough to write down the answers.”

Through their instructional programs, teachers created the conditions that enabled students to build their conceptual understanding to support further learning (Watson, 2001). The interviewed teachers actively sought out activities that would help their students work with the concepts in ways that would be interesting and help them make connections with the ideas being studied. One teacher explained how she made her instructional program one of largely “hands-on” activities. Enthusiastically she said,

You’re so involved with the kids and watching them discover, and watching their thinking [played out through their actions]. To me, science is one of the areas

where you're really helping a child to think, problem solve. Well, how are you going to do it? Show them the equipment and see what ... how are they going to use this to do ... or show them how to make, like these balloons [Refers to the balloons she is using to discuss high and low air pressure with her class.]. Well, why is this working? Why is it happening? Oh, well it's because of so and so, and so and so, and so and so ...

This teacher would regularly pose questions to her students related to everyday life and connected to the concepts being studied. She often sent her students home with questions to think about overnight and discuss with their families. Her goal was to get them "thinking about it". The following excerpt is an example of how she used this inquiry approach.

Like tonight they're going home to discuss with their parents whether they smoke or not, if they ever did smoke, why they smoke. If they didn't ever smoke, how did they manage to avoid it? And they said, What else do we ask? I said, You know what? You ask a few of these questions that we've talked about, and you're probably going to think up more yourself. And sure enough, ... they were coming up with ideas. And then I said, "Now go home and try it." And already, they were saying, "I'm going to ask my [Mom and Dad]." And it *was* a different question. So you've got them really thinking about it.

One science teacher stated that in planning his instructional program he tried to connect more with something related to students' lives,

... grade ten, it's got lots of connections, it's got lots of branches out to what's going on in the kids' world and provides the opportunity to connect some real life experiences. Biology, I find is very easy to pull in connections. There's something

happening every day in the newspaper that we could have a discussion of or pursue research in and ... the grade eleven course is really a gem for the students. It's all human systems which people I think find intrinsically interesting cause they're a walking laboratory themselves.

Another biology teacher explained that when beginning a new topic she thinks of how she personally relates to the concepts, her own personal knowledge and experiences that help her make connections. She used these connections with her students to facilitate her teaching of a concept, providing examples that they could relate to, and were within their experiential base. She related two examples from the biology curriculum:

When I'm teaching a topic, I will very often use kind of a blanket example, something I'm familiar with. When I taught succession this year, I said, "I want you to imagine your front lawn. Who mows your front lawn?" So they all [shared], "Dad." "I have to mow it. I don't get paid to mow it." Then I said, "Now imagine if no one mowed it for a week. What would it look like?" And then we talked about a year, and then ten years. And then we went into succession. So, that's one way I do it. Sometimes I'll show a video clip, sometimes I'll just show pictures on a video disk-player, and we'll try to figure out what it is we're looking at. When I teach about, say molluscs, I talk about rock snails, molluscs, clams, so something I think they might be familiar with.

This teacher explained that she activates students' background knowledge whether she is beginning a new topic or a new project. In both situations, she engaged students in sharing their collective knowledge and motivating their interest in the subject area. She explained the process this way,

The projects also have an overview, just kind of a background on what this information is. Checking for prior knowledge, I will often do at the beginning of any lecture ... session ... or when we're starting a project, "What do you know about this?" And, the kids will very often share information ... I was speaking about Arthropods, and one of my students talked about his yellow-kneed tarantula, and its defensive mechanisms. So that was kind of neat, because everyone exclaimed: "You have tarantulas?!"

At the beginning of every course, one social studies teacher had his students fill out multiple intelligences and learning inventories. He indicated that,

So I have an idea of the range of skills that's in my classroom and the different learning styles in my classroom. So recognizing that, I try as much as possible to balance oral with visual.

This teacher made a concerted effort to connect the social studies curriculum, which is about Canada, to real events that are happening and to make learning an enjoyable experience. He related,

I'm generally focusing on the current events of what's going on. And break it down and have the kids think critically and really engage them in the activity. ... We play a fun game in the class where ... everyone has to raise their hand when I ask a question. If they know the answer they raise their right hand, if they don't know the answer they raise their left hand. So that everyone participates. Then [I] can have the guarantee I'll never pick on anyone who raises their left hand. But it's really fun [to do].

One teacher talked about the importance of inquiry learning, defined through my interpretation of our conversation as having students unravel a concept by carrying out an activity that had been carefully planned to reveal specific curricular outcomes. This teacher consciously explored ways to provide students with experiences that related students' knowledge to content and made life connections. She explained that

I give them information, but I usually relate it to ... try to relate it to something they can really understand. So even the word molecules, if ... you give it in a way that they understand the word molecule, they don't need to know that molecules are invisible and da dah da dah dahhh.

She described the way in which she conveyed the idea of molecules to her students,

When we were doing matter, we talked about molecules. And I showed them drawings, I said, "if you could put molecules of solids in a box", (and we were doing surface area, too at the time, in math,) ... so I said, "Okay. If you could flatten them out to cover a surface, this is how many molecules would cover that area if it was a solid. This is how many molecules would cover that area if it was a liquid, and this is how many molecules would cover that area if it was a gas."

Encouraging Student Autonomy and Initiative

During the teacher interviews, it became evident that student thinking and mediation of this thinking through various activities was of prime interest to teachers and that this scaffolding was a significant part of each lesson. Teachers conveyed images of classrooms where student thinking and representations of their thinking were not only highly valued, but were encouraged. In fact, teachers conveyed high expectations (Goddard, 1997; Norwich, 1997) to students about their ability to *think* about issues,

without necessarily being tied to notions of correctness. Teachers believed that when students were encouraged to come up with their own ideas, the opportunities to develop relationships between ideas and concepts and to become problem finders and solvers were enhanced and, in this way, learning became personally meaningful (Watson, 2001). A middle years science teacher discussed how some students will tell her they don't know the particular "right" answer to a question she has asked them to hypothesize about. She finds that she needs to encourage students to believe that everyone has thoughts based on what they already know about a topic and that this becomes the basis on which we all make judgments, whether they are proven at some point to be accurate or not. She illustrated her point with the following scenario:

Teacher: (They don't know how to put their own thoughts down.)

Student: But what am I supposed to write?

Teacher: "Well, what do you think?"

Student: Well, I don't know, what?

Teacher: I'm not asking what you know... what do you *think* might happen? Put that down, that's what might happen. ... If it doesn't happen, were you wrong? Well, no. Okay, if it doesn't happen, we then look to see, okay, why did it not [happen that way]?

One geography teacher, cited previously, believed that education should encourage, "Out of the box thinking ... I really encourage that ... Don't want to just restrict them. I think that is what education is about as much as possible." Sometimes though, allowing student initiative and autonomy required a teacher to alter the original plan. He referred to an instance when a student requested researching a topic that was not

on the list of possible projects. Not wanting to restrict student choice, he conducted an internet search to ensure the topic was viable. In this case, however, the student-initiated project did not fit into the grading rubric he had designed for the original assignment. He agonized about his dilemma,

Well, I really [had] to adjust my thinking quite a bit ... I'[d] come up with a marking rubric ... And I ... walk[ed] them through the marking rubric to what I [would] look for and how many points ... like what is acceptable and what's unacceptable ... painstakingly go[ne] through that so when someone really veers off and it's totally outside the box, it's difficult to grade it along the same lines.

Another difficulty he encountered was that sometimes the independently selected assignments were not done well. The underlying factor perhaps is that when students take on an initiative, the tendency is to stand back and let them have some creative and academic freedom. He indicated that, "Sometimes [the students] go off ... when I see what they've put together, it isn't very satisfactory. But it's difficult ... that's when you get at the issue of how much [time do you put in each] week [as the teacher]. [Is the student] really exploring something and [did] they really learn it."

Scaffolding Instruction

Teachers in content areas such as biology and history reported spending considerable time pre-planning units of study, activities and projects. Some teachers indicated that this planning was to meet the various needs of students in their class, while others invested time in structuring the activities as a way to manage their classrooms effectively and ensure learning. One teacher found that when the structure was pre-established, students were clearly aware of expectations and able to proceed. At the same

time the structure of the activity allowed the teacher to circulate around the room to assist individual students. One teacher explained,

Before I do a research topic I try and attack it from a variety of angles so I do the ground work before hand. So that if I'm gonna introduce a topic, I know, well ...this level [of student] might go this way, this level might go this way. You know ... right down to the very simplest type thing and break it down so that I can give the kids a lot of options... options in terms of topics, and then if [a particular student] chooses [this] topic, I've researched it already ... here's some assistance that will help you with these sorts of topics. ... So for me it was to go to the various sites and really do the research in advance and know what's out there. Then present it to the kids, give them some choice, and really being on top of them and moving around the classroom ... like prepping them before they go in to do their research ... and what to expect, and where to go and if [they] have problems ... where you should go, and if [they] have problems there ... this is the way you should go. Just tons and tons of time on my side just to get it so that it works smoothly in the class. So that's how I generally do my projects.

To provide students with a step-by-step procedure for conducting research, one history teacher had his class do a research project together. He modelled the steps along the way and the class produced a finished copy that served as a prototype for future assignments. He stated, "So then at the end, their [projects are] very similar in characteristics ... But the kids understand how it's put together. And it's not such as daunting a task when they see it broken down into its components." He described the process of doing group research as follows,

If I take a topic like [the premier of the province], how would we do a research project? So brainstorm with the kids. We do a mapping on the board pulling things together and kinda come up with a strategy of how we do it. The kids would copy that down. Then we would go into the computer lab, all of us, and find as much stuff as we could on the premier. And then we'd sit down, we'd put it all together: What we think is important, what is repetitive, and then we work on it painstakingly, write it all out or on the overhead. The kids would copy it down. I went home and typed it on the computer so that they have what a term paper looks like with a title page and how to do what a reference page looks like. So then we put all the research and everything together, staple it together, and each student has a copy of an exemplar, like what was asked, how we did the ground work, how we synthesized everything together, how we edited it, how we revised it, and how we edited it again, how we came up with the final copy, how we put it together so it looks fancy. Then I give them a similar assignment like not on the premier, like pick [a political figure] from your region.

Differentiated Instruction

Common to all of the interviewed teachers was the inherent belief that every student had the potential to learn. To reach this potential, teachers talked about how they used different teaching strategies or assignments to give all students the opportunity to participate in and demonstrate learning in different ways. The interview data revealed that the ways teachers differentiate their teaching and learning varied from teacher to teacher, and within and across subject areas.

In analyzing teachers' descriptions of their instructional planning, it appeared that a core of concepts were addressed for all students, whether high or low performing. However, assignments, projects, and interactive lessons were planned to differentiate instruction for learners. This might lead teachers to provide more guidance and structure for some students, or alter expectations in terms of length of project, number of resources, amount of work, depth of thinking and choice of topic. One biology teacher explained his approach:

And so if they have to learn to write an essay it doesn't matter to me what level they are [at]. They're going to learn to write the essay to the standard. Scientific procedure, scientific research paper, right? So I would teach the same style of writing, right, to the G (students in general classes) as to the IB (International Baccalaureate). We have to produce the same kind of paper, *but* the topics chosen will be different in G than in S (university destined students) or IB. The amount of research they do, how they do their research, all that's where the difference comes in. But the end result is the same for all.

Another factor affecting teacher decision-making was the worthiness of an activity in terms of student learning needs. One biology teacher set different requirements for the IB (International Baccalaureate), S (university bound), and G (general) designated students. For example, students did a web-based research project and while all of them were expected to follow the same format for writing the paper, the length of the papers varied among the groups. He described his expectations, highlighting format and length,

... the format for writing it up is pretty standard. In the IB, it would be a four page research paper. [At] the university level it would be a four page research paper.

[At the G level] it would be a two page.

This teacher also provided more time for the G level students to work on their papers as well as breaking down the task into manageable parts.

But, I book more time in the computer lab for the G's than I do for the other students. But we work together on it. And I do give enough time on their assignments, and their assignments are always due in a three-step process if it's a research paper.

This teacher viewed research papers written by IB students as a form of enrichment, while for general students, the value of writing research papers was to give students a vehicle to apply what they were learning and make it more interesting.

Well in IB, I use topics, my research papers, as extensions of their coursework... university entrance I would use the research requirement as an enrichment. ... And for my G level students, I would use [the research paper] for interest ... to make it more interesting, more applying, and all that. So, it's a difference. But basically, there's a standard by which [students] have to do their research, and a standard by which they have to write. And so I use the library, we get together with the topics, we may give them a presentation on how to use Ebscohost, and other research facilities.

One biology teacher worked closely with a more senior biology teacher in planning the biology curriculum. Throughout the year they planned a range of activities that addressed different learning styles and intelligences, as well as student interests. The

use of a variety of activities was aimed at tapping into student knowledge through a variety of talents, giving each student the potential to demonstrate his or her learning. The teacher described an overview of the activities planned throughout the year,

We have, in the biology course, we have a lot of activities that appeal to a range of skill levels. We have some projects that the kids do where they can demonstrate their artistic talent. We have projects where they demonstrate their ability to write. One of them is a research project into their ancestry, which they seem to really enjoy. So a lot of them are real world applications.

The biology teacher in the scenario above found that the plan she had developed for a mixed ability group of students had to be altered for a class of students who were not strong academically. While maintaining focus on the core concepts, she found the students were more successful with fewer notes and more hands-on activities. This is how she explained the adjustments she made to the instructional program,

This semester, because our classes are so different, I *had* to... I changed my teaching style a little bit from his. I gave the same information in the notes, but I did not necessarily give the same volume of notes. I had to cut down to more of a core set of information, because the kids just couldn't take it all in. And, I also did a little more "hands-on" with my students than he did ... just because [of] the necessity of adjusting for the students.

This teacher also found that giving students more time to work with the concepts/content supported student learning, as she stated, "If I give them more class work time or group time, then the students do have a chance to excel. And they *do*. They do. Like the project work is fabulous for some of the students."

One teacher considered the reading and writing demands of the activities she used in terms of the students literacy ability levels. This teacher explained her decision-making process,

With this group especially because they were a little weaker in the reading and the writing, I didn't have them take notes all the time. Like even if I had notes prepared, I would often copy them or make skeleton notes. If I had the notes copied, then the students ... I would have someone read out loud. And depending on their skill level of reading, I would have them read once every, you know, two or three times we did this. Or a shorter section, I would find a short paragraph for them. ... And they would also have readings in the textbook to do, or if I photocopied an article, they would read that. But not necessarily out loud.

A biology teacher changed the way she conducted content reviews with her lower performing students based on her reflections of past performance. She told about one experience,

I got some silly stuff, and I think that's why I just used it once in this class. I could have probably gone through and directed it more, but I ended up using the last minutes of class for a class review of the topic versus tell me what you learned. It's just ... "Okay, what do we have?" So it was more of a verbal [discussion]. They were more verbally adept than they were with written [text].

While one activity might benefit a particular student or groups of students, the question of concern was whether it was feasible to use this format for the entire class. One biology teacher recounted using an activity involving drama to act out the life cycle. One student, who had been outwardly quiet and withdrawn throughout the year, suddenly

became an active participant in his group. The teacher's quandary was that while this was a milestone event for one student, overall the time it took was not satisfactory in terms of the content learned. In considering a more traditional approach, the teacher questioned himself, "However, would [this student] have come alive? He wouldn't have enjoyed that." Through reflective practice, teachers evaluated whether the activity and the time required was worthy of the number of students who were successful. However, success was characterized not only in terms of academic learning, as in the case above, sometimes teachers weighed outcomes in terms of personal growth.

Innovation

The interviewed teachers described how they would try out new instructional strategies not previously used but which had received positive responses from other teachers. In trying out a new technique, teachers reflected on learning effectiveness. This reflection led them to make adaptations to fit either student or management needs, or to drop the instructional strategy entirely because it did not work for them. In reference to the aforementioned integrated drama and biology activity on life cycles, the teacher explained,

But I'm willing to try something and see how it works. I think I might try a similar project. I need to retool it to get my averages up. It would have to be beyond the three groups out of ten that are doing well. Some of it may have been the implication of it, ... great idea but the last two weeks of school when my room is so incredibly hot [may] have had an impact on the success of this activity.

While educational publications offer a plethora of research-based strategies to make learning more meaningful and relevant to students' lives, these studies of best

practice do not articulate the finer details of application regarding different subjects or grade levels. Within this context, teachers are essentially piloting strategies within their classrooms, while under time constraints. This situation is evidenced by one teacher's comments in exploring the use of jigsaws,

I've tried jigsaws from time to time ... very popular in some schools ... in some age levels. I tried jigsaws this year and it took so long to achieve a very small percentage of the curriculum goal. I would not do that again and not with my elevens. Elevens have done much better in more independent work and smaller group sessions. We've had some debates and they did well with that. They want to do different things.

A biology teacher also discussed her experience in venturing to try out the jigsaw strategy. She indicated,

I usually [work] with small groups. I used it last year. It just wasn't working with this group [this year]. ... I think there were groups of five. And they would come together, and they would figure out a topic and discuss it. And then the groups would break, and you'd have one from each group get together, and they would explain the topic to the others. So ... and that was not bad. ... So, that was more an experiment to see how it worked. [But] ... some of my students in that class said, "Let's not do that again. Just give us notes."

B. Instructional Practices

Flexibility and Creativity

Planning. When teachers described how they planned their instruction, a number of factors guided their decisions. In talking about planning science lessons, one teacher

stated that her approach varied from lesson to lesson. One factor she considered related to whether students needed to be provided with more specific scientific knowledge before taking part in an interactive activity or whether there was an opportunity to use a problem-solving inquiry approach to facilitate learning. This is how she explained her approach,

So, it's not: first the experiment, these are the notes you need to take on it.

Sometimes they do this, sometimes they need to have facts, or I say: "Okay, before we start, here are some facts you need to know, and you'll need to be looking for." So when we were doing matter, for instance, I said to them, "All matter has mass and volume." And then we talked about what mass and volume were, and they took notes on that. I said, "Now, in this unit, you are going to be finding out all sorts of things that relate to these two facts. You need to be going back to these two facts when you're doing your experiments ... you need to refer back to these two facts.

With reference to learning new concepts, this science teacher explained that hands-on learning was not a matter of simply providing activities. She believed that to engage students in thinking, a teacher needed to prepare students for the introduction of a concept, and provide activities and text that would lead them to thinking about the new concepts. She explained,

And so if they do things that *allow* them to discover the answer ... but they can't discover it in a vacuum, the teacher's job is to give them some information to start. And so, you know, I'll let them read the textbook, or whatever, or give them

a handout. And I'll discuss with them, what is likely to turn up? And then let them see, What do you think will happen?

The notion of using worksheets or seatwork was never mentioned in conversation with any of the ten teachers interviewed. One teacher did mention that one of her books of science activities was accompanied by blackline master sheets for every topic addressed in the book. She stated adamantly however, that she would never use them as seatwork with her students, unless they had first worked with the concepts through hands-on experiences and then she would only use them in a way that was inquiry-based. She suggested that any teacher could,

run-off these sheets, and do one activity, and then they could fill in the notes, but, you know what? You can do that with everything. I could do the harmful effects of drugs. I've got hand-outs right here, [but] I won't use them, but I will only use them after we've done inquiry, and then [tell them to] go interview their parents. You know, talk to them, "How does this feel? What do they think about that?"

Another factor that influenced teachers' lesson planning was the topic to be studied. A biology teacher said that the way she teaches a lesson will:

depend on the topic. ... If I'm teaching them about flower parts, for example, I might have them draw the diagram of the flower, and then try to label everything they know ahead of time. And then, I'll put up the notes for that.

Based on student responses teachers would assess how well students were understanding new information and would change or alter their original instructional plan if needed. One teacher stated that while monitoring student learning, "Sometimes I'll just

... if they're having difficulty with a concept, I will stop what we're doing and switch, and do something different."

This teacher also used the direct explicit teaching model (Roehler & Duffy, 1984) in which she demonstrated a procedure on the board and then presented students with a similar example to work through while she circulated around the room assisting. By monitoring students' while actively working through the problems she could provide immediate assistance and determine whether students needed more examples or whether she could move on to the next step. She indicated that,

If we're doing information, on say genetics crosses, I will put up a question, demonstrate the first one, put up a second question, and say: "Okay, try this", And then I'll walk around and check to see how they're doing. And then I'll give the answer. If I notice they're having a lot of trouble with it, I'll do more examples; if they seem to get it, we'll move on.

A science teacher talked about how she encouraged student discovery during hands-on learning which then became the basis for class notes. When beginning a new principle she often used hands-on exploratory activities to engage students in working with the ideas. Students' discoveries were then recorded as part of their newly shared understandings. She explained:

So, they get information, and then if something else turns up ... and often a kid will turn up with something I haven't even thought of. And I'll say, "Oh, guys ... guys. So and so has come up with something really interesting, you need to write this down because it's important. So put this down." And they'll put that down,

too. And I say, "Now, that's another thought to keep in your mind when you come to... ."

Another teacher talked about the need to be creative as a teacher in terms of having autonomy over instructional programming. He referred to how teachers would feel if they were not allowed to make their own instructional choices,

Like how many teachers will teach on Monday ... this is what you are going to teach and here's how you are going to teach it, and Tuesday, here's what you are going to teach and here's how you are going to teach it.

Fostering Choice and Autonomy

All of the interviewed teachers talked about offering students choices across various learning activities, assignments, and projects. Student choice, for the most part, was consistently structured with students making a selection from a list developed by the teacher. Use of structured choice provided the parameters within which the content material could successfully be learned while still allowing students to connect with an area of personal interest. One biology teacher indicated,

Oh yes, every project has some fairly stringent guidelines, but there's a great deal of choice within it. ... With the waterfowl project they [had] to pick a waterfowl, but they [had] a list of, I think, [it was] twenty different birds to choose from. So there's a range ... [The] waterfowl project, the pre-selection was because we [had] data for the last thirty years on these waterfowl, so [students had] to use one of those, or research their own information. So these are all the waterfowl you'll find in [our province].

A geography teacher explained how she established the parameters for a project that required students to develop a product, figure out the raw materials that were needed for its development, and then set up factories in different countries while at the same time considering working conditions. Students were given a choice regarding the product, as well as how they chose to present their work -- power point, brochure, poster, an oral presentation, or a written report. One group of students, however, decided to present their information in three of the five ways.

The teacher recalled that, "One group [that] I would say was quite heterogeneous ... chose to present their information in three different ways. So, that was fine, one of them wrote their work and the other did it on a poster". (The third way was not identified.) This teacher felt that choice of learning modality was an important part of learning content information. She reasoned that the outcomes in content area learning are not about the particular way in which learning is achieved but that students acquire the basic concepts and information.

Teachers used student choice as a way to make learning personally relevant. The following example helps to illustrate this. One biology teacher recalled that she turned to the use of cartoon representations when students continued to have trouble with protein synthesis. They were given the task of creating a cartoon of their choice, a graphic representation, to explain the process and to help them carve out their understanding.

With the protein synthesis, that was the biggest thing that kids were having trouble with in that unit ... they just couldn't get a grip on what protein synthesis was. So going through the process of drawing a cartoon that matched it, made a

good analogy. They had to actually understand the process With the cartoon they had to do protein synthesis. How they did it was completely up to them.

Another teacher discussed choice in terms of the freedom to work at one's own pace. This teacher offered his students what he called "big time choice" in terms of time needed to read a text and respond to questions based on the text. He contrasted the notion of not having choice as being analogous to being "captive" as a learner. In his view, "It's kind of captive to read ... in this time frame and answer these questions ... I don't know that I [would] like this very much myself." Further, he envisioned choice as a creative experience for students. He explained, "But if you give them a bit of creative [freedom] to choose what they want to do, I think we lose some captive behaviour."

Projects, Activities and Assignments

Teachers used projects, activities, and assignments as part of their instructional program to encourage exploration and the processing of concepts. While projects, activities, and assignments varied among and within subject areas, students were engaged in variations of reading text, working with materials, and recording and presenting their knowledge by interacting with others.

All of the teachers interviewed had their students do varying amounts and kinds of project work during the school year. Teachers found that project work allowed students to represent their knowledge in different ways. Watson (2001) states that opportunities to work physically with materials supports students' thinking which is especially important since students may not spontaneously verbalize, especially in a traditional transmission approach to instruction. The kinesthetic handling of physical

materials provides sensory experience and is affectively both relaxing and satisfying, all of which supports mental reasoning and processing (Watson, 2001).

One chemistry teacher viewed the experiences of researching and hands-on activities as an opportunity to work closely with information, which led students to “reformat” and “mold” the subject matter to a level of personal comprehension. This teacher viewed projects, research, and activities as a way of providing students with more time and direct experience to work with concepts and content which, in turn, facilitated their learning. As opposed to memorization, a traditional approach to learning content, this teacher believed that by interacting with concepts over a period of time, students mediated their own understanding. He referred to the way in which he had his grade nine students become familiar with the periodic table. He designed a project in which the students were to create a children’s flipbook on the periodic table, atoms, and elements. In order to write this book for a young audience, his expectation was that students would have “to [distill the information] right down [as if they were] talking to an elementary school child.” The outcome of this activity was that the students,

made it kind of funny and silly, and they had fun doing that, and as a result it stuck in spite of them thinking that they would memorize items ... [They had thought I would] make them memorize a description of it. They learned and they enjoyed the way we had done that.

Although projects and activities were part of the instructional program of all of the interviewed teachers, the content, quantity, and frequency of projects varied from teacher to teacher and across and between subjects. One geography teacher, for example,

planned for one major project a year, with smaller projects and activities throughout the year. She stated that,

... I plan always to do one long-term project that takes a good three weeks. ... I also like to do a lot of little, you know, three-day projects. I use that poster paper a lot, just because we can put it up and it's really visual that way.

Further, the way in which she had students work through the projects varied, based on her assessment of how much support they needed from her. When students were considered to be motivated, they were given fewer teacher guidelines; whereas for those students whom she had previously observed being inefficient with their time she would structure their project in specific steps. The teacher explained her procedure this way,

Usually I find the kids are highly motivated on those projects, and I try to break [the assignments] into chunks, and it depends on, you know, the class. Sometimes they are really good time managers and sometimes they are not. So I'll chunk it down more for the kids who aren't.

Several teachers stated that they were often amazed at the quality of understanding and the personal talents revealed by struggling students when given the opportunity to engage in project work, talents which were never previously reflected through work that was strictly paper and pencil.

One teacher was made particularly aware of the often hidden talents of low-performing students through the project work she assigned in her biology classes. Due to provincial high school credit guidelines all students must have a science credit at the Senior 1 level. Students who are weak in science or who struggle in school often opt for biology over physics and chemistry. This teacher found that she was often amazed at the

understanding these students communicated through means other than paper and pencil tasks. Her experience demonstrated that, “... if some of [the students] have artistic skills, but [weak] English or mathematical skills, they can [still] do a wonderful job [on projects].” Referring to her students’ representations of protein synthesis through the medium of cartooning discussed previously, this teacher stated, “And I got some fabulous stuff in from some of my weaker students.” Projects provided students with the opportunities to demonstrate their understanding through the use of other modalities that often represented the source of student talents.

Another teacher explained how she used project work continuously throughout the year as the core of her social studies program. Projects were viewed as a vehicle that allowed students to process information in a personal way. She explained that “[Project work] tapped into the way students make connections to the content [from] personal knowledge and interests”. Project marks formed the basis of student grades for her course and “avoid[ed] memorizing and regurgitating information” characterized by traditional testing that she deemed as ineffective and uninspiring ways to learn. Two guidelines that this teacher used in selecting projects were that they appealed to student interests and were relevant to student lives. For one project, students had to select a logo or image that best represented Canada. They then had to illustrate the events that led up to a major milestone in Canadian history by writing up the events, describing the links between the events, and graphically illustrating these against the logo as a background. Student selection of what was Canadian represented a wide range of personal interests and experiences and collectively, when displayed in the classroom, presented a rich portfolio of Canada. One student selected the C.N. Tower in Toronto having being

impressed by it during a family vacation, while a pair of boys struggled with the idea of knowing any Canadian logo until, in discussion with the teacher, linked their passion for hockey with the idea of stringing together representations of hockey jerseys for their backdrop of Canadiana.

Transitioning from a Lecture Format

In the survey, a number of teachers included lecturing as one of their often-used instructional approaches. However, the notion of what has traditionally been embraced as a transmission model of instruction with the teacher at the front of the class talking, while students sit at their seats taking notes, did not match the kinds of lessons which drew on active student engagement that these teachers described. Rather teachers related an interactive environment in which they engaged learners cognitively by incorporating visuals, graphic organizers, hands-on materials, fostered an environment in which students were encouraged to be active listeners, and were encouraged to clarify their understanding by asking questions. One teacher did reflect on her use of the term "lecture" by stating, "... probably lecture is the wrong word because I'm trying to engage them into it too, so it's probably more interactive." Another teacher did state that students "don't relate to lecture", and then described the various forms of lecture she used, each underscored with the intent of having students become more actively engaged in their learning.

Based on teacher interviews in this study, the lecture method of "sage on the stage" has clearly been transformed into a more interactive approach to instruction, reflecting a more constructivist philosophy.

While lectures continued to be teacher-directed, students were no longer passive listeners. Teachers regularly described their “lectures” in terms of being physically at the front of the class. One teacher described her perception of lecture as,

I’m in front of the class teaching *something*. Now it could be in a variety of different ways. [I encourage] a fair amount of interaction from the students when I’m lecturing, they will, you know, ask a question when they’re not understanding something.

Another teacher replied,

Lecture format for me, it’s more like ... ahh that Socratic questioning type idea. Where we’ll look at a topic and we’ll do a little K-W-L type thing, where what they know, where we’re going, and then take it from there. So that’s more of my lecture format. Yeah, like whenever we’re doing anything like that, and if we are taking actual notes down or something like that, it’s never just disseminating information. It’s generally always some interactive and questioning and things like that just to keep them involved.

Thus lectured lessons varied considerably from teacher to teacher and within and across subjects. Teachers’ decisions to use various instructional methods and teaching materials within the lecture format were determined by several factors. Among the considerations that teachers articulated in the interviews were: the particular content, the learning needs of the students, and student management concerns. The following was one teacher’s explanation for changing the way she used the lecture format in biology to facilitate other issues that she perceived influenced student learning,

I prefer using the chalkboard, but with biology I tend to use the overhead. This semester specifically, because it allowed me to watch the class while I was writing things down. ... But I did show video clips through the projector. We also have a video disk player. So during the course of the lecture, I would show pictures on the video disk player, or little clips on that.

A lecture format used by another teacher was to place an outline of the content she planned to cover on the overhead projector. Students were given a copy of the outline that had been altered with fill-in the blanks to serve as a listening guide. Students were required to fill in the key words. Other "lecture-style" teaching used by this teacher was what she referred to as "jog and talk" which involved a combination of teacher at the front of the class explaining and using the blackboard to illustrate or diagram certain points that were better understood through visual support. A third way she used lecture involved listing the main points of the lesson on an overhead transparency, discussing and elaborating upon them one at a time while using visuals, such as pictures/photos and hands-on activities to build understanding throughout the lesson.

Another teacher described a lecture approach in which he engaged students in a large group interactive session. Prior to a chemistry lab, this teacher engaged his students in a discussion to link the previous lesson with what they would be doing in the upcoming lab.

The Role of Textbooks

Although textbooks were used by some of the interviewed teachers, they were not the sole focus of instruction from which students learned content area information. Throughout interviews with these teachers it became evident that they were less reliant

on curriculum guides and textbooks to direct their teaching. The focus of their teaching rather was on presenting the main concepts and helping students to make meaningful connections with this content. One teacher and her more senior colleague, who formed the science department, did not in fact order the teachers' manual when they purchased new textbooks for their department. Since these teachers felt knowledgeable about and competent in teaching biology, as mentioned in the first part of this qualitative analysis, the textbook instead served as a reference guide to supplement their program. The biology teacher commented, "It's unusual to find something that goes along with your... the way you've set up your program. Lucky find. (Laugh)." The teachers' goal was to find a textbook that supported their program rather than one to drive their instruction.

The role of textbooks differed from teacher to teacher and was influenced by a number of factors. Teachers of history and geography generally reported that the available textbooks were outdated and they preferred to use other sources such as the internet, newspaper articles (from the archives) and books of historical accounts. In the sciences, reading material seemed to vary but consisted mainly of teacher-gathered materials from the internet, journals, books, government publications, and other available sources. A geography teacher stated,

I mean it's the easiest thing in the world to use the textbook to answer the questions from a teaching perspective. ... we do have a textbook. But the curriculum is in the process of changing and I have kind of gone to the new [curriculum]. So the textbook is old and horrible, it's horribly written anyways, so I don't like it so I find other texts [forms of print].

While the textbooks that teachers had available to them were generally outdated, it appeared that as textbooks were developed for new curricula, teachers would consider using them. One science teacher stated that the textbooks to which he had access were well written and provided a good source of information. The problem he encountered in using textbooks was students' lack of effective text-processing strategies to comprehend text.

In responding to the question of how decisions were made with regard to textbooks purchases, a biology teacher explained that school administrators considered which course was most in need of a new textbook series. Since science recently experienced a curriculum change, the science department was able to purchase two class sets for a total of seventy books. According to this teacher,

I think our administration looks at what curriculum is coming in new, and who hasn't had new textbooks for a while, and whose textbooks are gradually turning into dust. And ours were getting pretty close. So we found a wonderful textbook that covers everything in our course and *then* some, and so we've managed to pick those up.

Several teachers discussed how they evaluated texts to determine their suitability for learning. Teachers critically scrutinized the selection of textbooks, considering many factors such as readability level, page layout, use of supportive coloured illustrations, inclusion of extra activities, and articles from other sources printed within the text itself to make the topic more relevant to students. The biology teacher, whose department was recently able to purchase textbooks, explained the process they used to evaluate texts.

We checked out about four. The reading level (of the text that was selected) was good. It had lots of colour, lots of pictures, because if you're dealing with city kids and you're doing ecology, they have no idea what a fox eats. They might think a fox could take down a deer or a moose. So having the pictures was really good because a lot of them aren't familiar with the animals. It had a lot of extra activities or little labs buried in it, although we haven't used any of those yet. And they have articles highlighted. One of the articles I remember the kids were getting interested in was "The Great Potato Famine". ... Packed with information, good glossary... Ummm, just trying to think, and it's kind of organized the way our biology course is organized. In fact it has way more information than we need.

The recollections of one history teacher about her own middle and high school experience that consisted of reading textbooks and answering questions at the end of each chapter strongly influenced her present instruction. She grew "to hate" school. She believed that textbooks "tend to be horrible and lack the interests of students", are "deadly boring", and contain "too much extraneous material" that often masks and makes it difficult for students to identify the main ideas. She referred to herself as, "not a textbook person". Her personal experience with textbooks had inevitably led to "memorizing and regurgitating" content in order to succeed on tests. To counter "memorizing for the sake of memorizing", in her own teaching she preferred to use a variety of approaches through which students could not only acquire new information but also represent their understanding and thinking about the content in more meaningful ways. This approach to learning she termed "multi-modal".

In further elaborating on her use of informational sources other than a textbook, she described using newspaper and magazine articles as well as internet sources. She found that articles and newspaper clippings made learning more relevant and that current up-to-date, human interest stories appealed to adolescents. In particular, she felt that these materials served to be a more dynamic way of instructing low-performing learners since, "They could read and apply [the content] immediately" to what was going on in the world.

A science teacher explained that she searched for information from a variety of sources, "Sometimes from other textbooks, often from ... all over the place." Although this teacher preferred to use a variety of informative sources in her teaching, she confided that this approach presented a challenge in terms of how time consuming it was to gather relevant and meaningful materials. In particular, she recalled her experience as a first year teacher in acquiring non-text material for a science course ... it's so so exhausting."

A geography teacher reported that the new geography curriculum may have developed online resources rather than a supporting text, which she said "... makes sense in a way. Everything is changing so quickly it might be a smart way to go." However, she noted that websites, while current, are not necessarily permanent sources. She explained that, "I had a great website last year and I can't find it this year so that yeah, I don't know, I think it's constant [the changing availability of websites] and I don't think that will change."

Moving Beyond Textbooks

It appeared that when textbooks were not the focus of the instructional program, knowledgeable teachers used their own innovative planning to instruct students in ways

that were meaningful and adaptable to learner needs.

One Canadian history teacher used articles detailing the lives of individuals who lived during the settlement of the province. Over the years she had collected articles discussing the human scandals that occurred during this time. The purpose was to demonstrate to students that real life things happened to people in the newly settled colony. She found that students were able to relate on a more personal level to historic times once they could identify with the people, and in this case the dilemmas that people living then faced, that still influence life now, in the millennium.

A biology teacher discussed how she incorporated newspaper articles into her instruction to provide real life connections to concepts and topics in the curriculum. She explained that,

...we'll [referring to the biology department] cut it out and come up with a way to use it. A couple [of] years ago, I found something [about] a child [who] was genetically chosen for in-vitro fertilization to be a donor for her brother or his brother. I can't remember the gender of the [child]. And we used it to talk about ethics in genetics. So that was a focus of three days on that article.

Three articles were published in the newspaper about this particular case involving in-vitro fertilization. The students responded to the first article using an article analysis format adapted from the English Language Arts Curriculum. The next day the students responded to a second article after acquiring some new knowledge from the initial article. She explained,

... they wrote about [the first article], their impression and their reaction, and how they felt about it, and the next day they had the second article. And, I had them

write a new analysis, what's changed now that you have this extra information, ...

Some people kept the same opinion, some changed.

As suggested previously, a number of teachers stated that they used the internet to provide the most current information on a topic. Teachers reported that they spent a lot of time searching for and previewing websites that contained information that matched their curricular goals and that would meet the needs and reading abilities of their students.

One biology teacher pre-selected websites for student research assignments in his course. He stated, that the websites were, ... for everybody. There's no googling allowed. They have to use the websites that I use. Because I know the websites, because I know that they're valid."

Of special note is one teacher's perception of the reduced role of the textbook in the content area classroom. She felt that getting through content heavy curriculum was priority for many teachers, taking precedence over reading text in the content areas. She explained, "I know that sometimes teachers are pressured to feel like they have to get through their content and so as a result it's easier to give [students] notes," written by the teacher rather than have students take the time to read the text and write their own notes.

Study Notes

The use of notes and the way in which notes were developed varied across teachers and subject areas. The range included teacher prepared notes, notes that students copied, notes that students wrote in discussion with other students, to notes students made during a lecture. One teacher discussed two ways in which she used notes. This teacher explained that she most often had students copy notes from the overhead. Through past experience she found that when prepared handouts were used, students tended to place

them into their notebooks without looking at them. When she used handouts she supplemented them with class discussion or an activity that engaged the students with the notes. She elaborated further:

So that I'll give them a note and then I'll talk about it. ... I usually have them copy them. I find that when I hand them out, unless I'm using it as an exercise ... they go, "Okay, that's good," [and] shove it in their binder. Fill in the blank kind of stuff is good. That works. Or if I say okay we are going to look at these notes and let's highlight the key words or you know ... some activity with the notes ... but if I just hand it to them, forget it, it's lost ...

One science teacher taught her grade twelve students two different ways to take notes from their biology textbook. She described her instructional plan as follows:

So, we very specifically talk about, "How do you take notes out of the textbook?" And, with that one, we talked about the structure of the textbook and how you can take notes most effectively. The kids have two methods they can choose. They either have all the questions of all the information I want them to have, and they can answer them straight. So that's one way they do it. The other method is "Look at the information I want you to have, read the section of the book, what information do you need to write down?" And, some kids much preferred making notes. And then the next day, I would walk around and look at [their] notes, and I'd hold some up and say: "Look. Use of colour. This person also has their definitions all indented and highlighted. They used underlines for headings." So we talked about that. And then the next day, we took notes, again. So we had a day where we did some review about what good notes

look like and then next day we did notes, again. And then the day after that, I said, "Okay, now lets look at this." What I did notice a little bit this year, but a lot more last year, was the quality of notes went way up at the end ... much better quality notes. But some kids, they need the question/answer, question/answer, question/answer, because they just can't synthesize.

Teaching Text Structure

Some of the teachers who indicated using a textbook at times during their course discussed how they taught certain aspects about how textbooks were structured. One science teacher explained that she teaches students the various parts of the science text and the kind of information provided to the reader to support students' comprehension of the content. She explained her instructional methods,

Well, when we first start doing questions out of the textbook, I talk about ... like where you can find information in the textbook. We talk about using a glossary, using the index ... And, believe it or not, I also teach them where to find the table of contents. We also talk about, like the introductory information is right at the very beginning ... Sometimes ... I'll talk about, like what's in that first picture and how it's useful.

Some of the interviewed teachers using text also described ways they instructed students to support their comprehension of informative text. One teacher explained, ... right off the hop, I'll give them informational text. I usually start off with easy things but lots of headings, lots of you know, where the text is not solid writing and we can look for context clues, or whatever, and I run through different kinds of sequences to help them. I explicitly teach them how to read it. And then

sometimes I'll actually make up a work sheet ... What do you see, you know very explicit teaching, and then I kind of back off from there, but I remind them constantly when we do it.

Teaching Metacognition

Interviewed teachers discussed a range of learning and memory strategies they taught students, most often related to their personal use of strategies rather than being common to particular subject areas or grade levels. One teacher discussed how she modeled ways to help students remember terminology, which is a large component of the biology curriculum. She explained how she taught students new vocabulary using the strategies she personally employed and the importance of connecting it to what they already knew, as revealed in the following example,

I don't have a very good memory for things that don't quite connect with stuff I already know. Which is why I try to connect things to what they already know. If we're talking about hypocotyls on an embryo, for example, *hypo* means under. So we talk about root words.

This teacher also drew students' attention to the visual aspects of words to aid memory. She explained,

When we're doing DNA and RNA, I [try] to teach them how to remember to connect *adenine* goes with *thymine*. I said they're both letters made with straight lines, and *guanine* and *cytosine* are made with curvy lines. So, like even stuff that basic.

In order to help students process the information in biology that is heavy in terminology and hierarchically ordered, this teacher taught students the use of

mnemonics. She explained her approach in the following excerpt,

I can't remember which topic we were on ... I was doing it, *again*. I just do it while I'm giving notes or discussing something. One of my students said, "Boy, you've got tons of these!" I know some of the kids really need it. And it's sometimes like Kingdom, Phylum, Class, Order, Family, Genus, Species. That class ... I gave them the list, and then each of them had to come up with their own mnemonic to remember it. But we got some really funny ones, so that was just a five-minute activity we did to remember that one.

The biology teacher mentioned previously also taught study strategies in preparation for exams and how to approach different types of exam question formats with her students. She described her approach as follows,

I know when we're studying for the exam, for example, I talked about how you study if you're trying to pass versus how you study if you're trying to get a really good mark. How you can study ... How is this different from English? How do you do an essay versus a multiple choice, like how do you study differently? I try to demonstrate something that they might be able to apply.

Group Collaboration

Interviewed teachers had a variety of perspectives on the purposes for group work and considerations in forming groups and having them work effectively. Discussion with teachers revealed that within the reality of the classroom there were numerous contextual factors to consider when having students work in groups.

At least half of the teachers used both small and large collaborative group arrangements to have students to build their understanding of the topic under study. Small

discussion groups were sometimes a part of their interactive lectures. One geography teacher described how she incorporated small group interactions throughout her interactive lectures when beginning a new topic. She explained her reasoning for using small collaborative learning groups as well as how she used them,

Well, probably because people, researchers, experts, you know, believe, and I tend to agree that talking helps you to remember ... develop ideas ... and you know people feed off each others ideas. So I do try to actually have them, if it's a new idea we're looking at, to write something, or whatever first, themselves, so they're not completely ... only listening to others, and then they have something to contribute, too. It starts as a stepping stone, so they write something, and draw or whatever, and then they can share what they have and then that leads them to think of another idea. Usually ... you know ... so it's more ... the three minds are better than one idea.

One teacher who regularly used interactive small and large group sessions found that regular student attendance was necessary in his chemistry classes when this approach was used throughout the course. This teacher explained,

Because we do so much group work and collaborative work ... umm ... if you miss two thirds of the course and the school hasn't kicked you out yet, well you're still here, and you're welcome to be here ... But you're really far behind. It was the biggest problem with everyone who's failed.

When beginning new concepts this teacher found out through large group sharing sessions what students already knew. He continued with the whole group session preparing students by linking their shared background knowledge and applying this to the

upcoming lab. Small group discussions were used to talk and write out their lab work, followed by whole group sharing sessions that allowed students to share and add other ideas to their notes.

Some teachers found that the use of collaborative learning groups had not proven to be as effective with particular groups of students. A science teacher discussed how the classroom dynamics of one of her classes led her to use collaborative groups for particular kinds of work only, and even then she decided to limit group size to pairs. To reduce distractions, groups were located in different rooms. She explained the situation,

I do a lot of small group work some years, not so much this year, just because of the nature of the class. But all [of] the project work, or even ... there's some assignments, I'll let them work in groups versus individually. Most of my assignments this year I let them pair up ... and that seemed to work fairly well. And I even moved some of them into my office and across the hall into empty rooms. This worked *fine* with two or three of them.

One of the activities in which she used paired groupings with this class was to read a controversial text together, discuss their understanding and point of view. She described a class in which many of the students were determined to voice their opinions and the role she took on as mediator in this situation. She explained,

... We had individuals that had no *problems* telling us what their opinion was (Laughs). And when we hit topics where opinion *was* what needed to be expressed, if we're talking about the abortion issue or genetic engineering, that was very interesting. But, I didn't get too many of those going this year, again

because of the nature of my class. But last year, when I did the bioethics topics as a project, the kids got really into discussing it.

Small group discussion continued to be particularly ineffective with this particular class who had difficulty sustaining concentration on a topic. In discussing this dilemma with other teachers who taught these same students, a new strategy emerged, with teachers deciding to have students hand in a written piece at the end of every class. The teacher described the situation this way.

I had a lot of kids who would go off topic very quickly, so [group work] wasn't a very effective way for them to get their work done. ... this particular group was also in the same Law class together and in the same Applied Math class together. And, all three of us [referring to the teachers], we spoke about these kids. ... The math teacher, said: "I have them hand in something at the end of every class." I spoke to the Law teacher, and she said: "I've started doing that, too; everything has to be handed in." ... I decided this was what they needed: "This is what you have to do, and you have to hand it in tomorrow, and then I will mark it." I have a problem with that because I don't want them working for marks, but ... with the group work, they would relax in class in their group, and then rush through it at home. So there was no opportunity for me to say, "Were you having trouble with ...? What do you need explained?"

One chemistry teacher who mainly used collaborative learning groups throughout his classes stated that he has become more aware of student ability levels. He was struck by the way learning groups increased the comprehension of chemistry principles, an understanding not captured by paper and pencil tests. He explained that he had

discovered, "the results of test scores are not necessarily a reflection of the ability levels" he has observed in class labs.

The next part of this paper discusses teachers' use of homogeneous and heterogeneous learning groups.

Homogeneous learning groups. Several teachers indicated that they used homogeneous grouping for two major purposes. The first was to have groups in which students worked well together, and the second was to complete a task within a minimal period of time. For these reasons, teachers often allowed friendship to be the organizing factor in forming groups. Invariably, teachers found that when students were allowed to form their own groups, they tended to be at a similar academic level. One teacher recounted her experience with student - selected grouping this way, "I wanted them to be comfortable with the people they were working with, so I allowed them to choose and for the most part they were homogeneous." Several science teachers reported that they let students decide who they will work with, the expectation being that friends work together amicably. A biology teacher expressed his practices, "I ... group informally ... So if they [were] doing a lab and all that, I would let them choose their groups for a lab, because they have to do the work after, and they have to work together."

There was a general shared view among teachers that for short term activities, for instance, brainstorming for background knowledge, groupings formed on the basis of friendship worked well and were efficient. One teacher explained, "Sometimes I just do it because they are sitting beside each other and I don't want to [take the time to have them] move. One geography teacher regularly allowed students to select their own groups for

discussion and sharing activities and found that since students were often seated near their friends, groups could be formed quickly.

While the homogeneous grouping of low-achieving students might be called into question, one teacher recalled how a group of students in her geography class were successful in working together. She presented her analysis of the factors that contributed to the success of this low-ability group,

In that particular project they were highly motivated because they got to choose their product, they had a lot of choice, they were also allowed to choose how they would present their findings so ... and that also kind of motivated them.

Teachers also identified the problematic areas encountered when groups were formed on the basis of friendship. One teacher was both observant and perceptive about the interactions occurring among students in his class. He had observed students who were left out when groups were formed on the basis of friendship. Some of the underlying reasons that he indicated for students not being affiliated with a group included: their friends were in another class, students were quiet, more introverted or on the margins, and they were English language learners. Peer-group or clique associations can be significant in the adolescent years. He explained, "If I let them choose their teams, people [get] left out. It's a bit of a dilemma. How can you force someone to be someone's friend? Right?" This teacher had noticed some differences in how grade tens and elevens were able to move out of friendship-based groups, "So I've struggled through that with grade tens and elevens. Elevens have been a little easier to do than tens."

In considering groups composed of friends, one teacher felt they offered a secure environment for some students whereby groups not based on friendship left students at

the adolescent level feeling at risk. This teacher related his perception of how students might feel when they were grouped without their friends.

“Now, other people in the group are going to discover how stupid I am” ...

terrible fear for them. “Oh, I don’t want anyone to know that I’m dumb and I don’t want to appear dumb.” So [they] either act cool or act like they don’t care, and then it doesn’t matter. So then you’ve got kids [uncomfortably] placed in a group. They are resistant and won’t participate.

At a time when self-esteem is already low, the dynamics of grouping students may need strategic planning founded on interactional or behavioural theory.

Teacher responses revealed that homogenous groupings offered both strengths and challenges in helping students learn. On the positive side, students were closer in ability level and instruction could be targeted towards this level. Students sometimes felt more comfortable when differences in ability were not obvious. On the challenging side, if the group was weaker academically, then those students who could take the lead in initiating discussion and understanding were absent. One teacher explained that on the one hand,

There are some distinct advantages because you don’t have to worry about the high-end kids going insane. There were a couple of high-end kids, and I could tell that some days they just couldn’t believe the obtusiveness of their friends. But, also not having any high-end kids in the class [meant] that there’s no good examples of what the work could look like.

Heterogeneous learning groups. Teachers also reported a variety of reasons that guided their use of heterogeneous grouping. A common philosophy shared by teachers

was that students need to learn to work with others, regardless of friendship ties. To this end, heterogeneous groups were often formed by teachers sometimes randomly assigning students into groups and at other times spending time planning groups with specific factors in mind. A science teacher reasoned that these groups reflected real life dynamics, creating instances to interact with others who may not be close friends. He reasoned that, ... "But you have to work with people. I mean when you're older and you're not necessarily friends [with] your colleagues and you have to be able to interact without having that friendship background."

On the other hand, when students were working on assignments that required understanding and manipulating of content knowledge or were being graded, teachers created heterogeneous groups in which stronger students could support the learning of lower-performing students. The underlying belief was that the weaker students would benefit from hearing the stronger-performing students talk, discuss and share their knowledge. "... we'll [biology department] match top student, bottom student and so on ... When you do it that way then if [marks are involved] they can work together and they sort of shed light on things ... Yeah, it takes a while [to plan groups], and ... ahh the grouping's important cause ... in things like [students are being graded on a lab] where you need that mix of students, you have to think about who you want working with [whom]."

Another way in which teachers used heterogeneous grouping was for major or long term project work. One teacher stated, "But if it's something that's ongoing for several days I'll carefully group them."

Teachers reported using a number of different ways to vary group membership.

One teacher stated, "I'm constantly mixing them up. ... I constantly change and sometimes I just number them off." A science teacher used creative means to sort students into mixed groups, such as favourite ice cream flavour and birth month.

However, he found out that he had to constantly generate new ways to form heterogeneous groups as students soon caught onto his methods. He described how astute students could be once they become familiar with a sorting method, in this case favourite ice cream flavour. "They will try to return back to their group of friends," for instance by unanimously declaring, as a group, their undying love for chocolate ice cream. Several teachers recognized that students do not generally relish the thought of being placed in heterogeneous groups; without a choice of partners or having something in common.

Challenges in using collaborative groups. One teacher stated that he found himself constantly making decisions about the worthiness and appropriate use of learning groups. He found that it was not always possible to perceive ahead of time the dynamics that would occur among students. Clearly, a teacher using learning groups needed to be reflective and flexible. As one teacher said, "So I know it's a skill worth learning, but I have to balance that again with how much they'll learn. The kid who doesn't want to be seen as stupid can learn from me in a different form, whereas [when] having to interact with his peers, he won't say a word."

Another issue determined to be significant in the success of group activities was the interpersonal relationships operating among students, influenced by the period of physical, emotional, moral, social, and intellectual change experienced during adolescence. Teachers and peers experience a range of behaviours and frequent mood swings, vacillation between the desire to be noticed, and embarrassment at being singled

out, demonstrating feelings of inferiority, and disputes between friends (Saskatchewan Education, 2004). One teacher described a situation that occurred in his class,

Some of my students, one group, one of their group members had some relationship problems, so that spread like a virus and everyone [was] upset about this girl being dumped. Ummm ... so ... ahh ... there's so many factors to consider with young people and that's what makes them interesting, I suppose, but also [it's] difficult to manage all these other things that come up.

The relationship break-up of this grade ten student with her boyfriend and the girl's subsequent reaction impacted on group members and their ability to work together and focus. The teacher found, "It certainly inhibited her performance. She couldn't do [the presentation] that day and they had to do it the next day [and she was still too upset] and then they had to do it after school." The emotional state of the female student dealing with relationship problems impacted her entire group. One teacher summed up his experience using group collaboration as a vehicle for learning indicating that it was a complex issue and not simply a matter of, "Yeah, we're all equal; we all like each other."

Another teacher stated that her personal learning style was a hindrance to using collaborative groups,

... that's one of my blind spots. I personally prefer to work individually. So for me to develop a group project, I don't think it's as smooth as someone who likes working in groups and can come up with all the great ways. So I'm still working on that one.

This teacher also felt that some students failed to put as much effort into their work when working as a group. She explained,

This particular class I had, loved working in groups, because they didn't like working. So it's like ... "Okay, we'll all be lazy and everything's fine." ... it wasn't until I said it's due tomorrow, or if it's short enough it's due today, that they could actually focus long enough to drop the social stuff. But most of the times, a little bit of talking is fine. ... I'll monitor them and wander around the room, if I hear it gets social, [I'll announce] "Okay, your break's over." ... But this class, I think, kind of preferred other people to do work for them. So, I didn't do as much group work ... it just wasn't learning.

This same teacher found that some students had a preference for working by themselves. She described her experience with a class from last year,

But last year's group I had, was a lot stronger, and they preferred being responsible for their own marks, and not depending on ... And it wasn't every kid. I'd say about two-thirds of the class preferred to do their own stuff.

Group size. Teachers responded differently to the issue of group size. Some preferred large groups, while others found that small groups were more effective. A science teacher found that a collaborative group of six students was unable to reach a group consensus. However, on the other hand, they arrived at a larger pool of ideas that was insightful and worthy of consideration. She explained one activity as follows:

... I had a thirty-person class, so it would have been five groups of six. And they had to come to a consensus within the group. ... And then they came back and reported to the class what they decided about this issue. And one of the decisions of one group was, we just need more information before we can decide, which we discussed and decided was a legitimate decision.

In forming groups, another teacher considered not only his preference for smaller group size but also the physical layout of the room and students positioning to one another,

I prefer triads. ... They work the best. And we report, and I have a flipchart, and we use some chart paper, and we do walk-arounds, and, you know, we go through the whole system. Just the set up of the room, the tables. So people face each other and work better. Four is sometimes okay, but ... too much talking with fours.

Another teacher provided students with a choice of grouping arrangements but shared the preference for a group size of three along with the aforementioned teacher,

The only thing that I specifically say you must work individually on is a quiz or a test or a project, that's an individual project. Other stuff they can work with a partner, they can choose to work alone, or they can work in a group. And usually I limit the group size to three, otherwise it just becomes a party.

In discussing group learning structures, it was discovered that definitions may vary from teacher to teacher. For instance, one teacher considered group work to be more formalized than partner work, requiring co-operative learning structures (Johnson & Johnson, 1975) such as specific roles and a time frame. She expressed her view,

I don't ... we don't set a time-keeper ... So I consider it more partner work, rather than groups. Because with groups it strikes me as more formal: "Here's your task. It needs to be [completed] by then, and this is your reportable or what you need to really present." Whereas ... they can choose to work alone or choose to work with

somebody else which really helps if they've got a low reading level ... the other one will [say] "It's right here."

C. Assessment and the Challenge of Time in Teaching Content Area Subjects

Testing

The way student learning was measured varied from one teacher to another.

While none of the teachers interviewed relied solely on paper and pencil testing, some of the teachers used testing regularly, others occasionally, while still others used testing in non-conventional ways. All teachers indicated allocating some portion of the term grade to project work. Projects generally consisted of students working in small groups to conduct research or to share their collective understanding, culminating in some form of written and/or illustrated response. Even the teacher who used testing on a regular basis incorporated project work and research assignments into his program, thus valuing individual talent, particularly that of struggling students and providing an alternative to testing as a way of demonstrating knowledge.

Rationale

Some teachers stated their rationale for testing as a way to measure foundational knowledge needed to understand more complex concepts. One teacher explained that he tests to establish mastery. "I want to know, do they know this stuff? Do they have the details down? Have they got it figured out?" Another teacher who included traditional testing as part of her assessment program explained her rationale.

Partially I do that because it's a shock to go into an exam if you've never seen what a teacher's test looks like. ... On the other hand I don't think it's a bad idea to get kids to do some tests. It's just another form, you know. ... Personally, my

belief is as long as it's not the only form of assessment I'm doing, but it's scattered with all sorts of other things, then, you know, kids are strong in different areas and some kids do well on tests ... So if we are looking to see what they know ...

This teacher stated that she used tests in geography every second unit of study to determine if students understood the content.

Variations in Testing

Although some teachers used traditional testing, the design of the tests varied. One teacher explained how she designed her tests so that even the weakest student could acquire enough marks to pass. She described her testing philosophy as follows:

... if you've been in class taking notes, and at least trying, you should get fifty percent on your test ... But if [the student does not get fifty percent] because some of [the questions are] tricky, we also have the projects and daily assignments. [And] for students who do not do particularly well on tests, there are assignments and project marks as part of term marks. [The student has] enough support. If they are trying, they should be able to cope.

Unconventional Testing

Conversely, some teachers used more unconventional methods of testing. One teacher described how she had students participate in an activity at the end of a unit of study, rather than use a traditional test of rote memory from notes. This teacher, for example, developed activities that required students to apply knowledge gained throughout the unit. The day prior to the "test", students were told to review their notes on a particular topic. The next day the "test" took the form of an activity that students

completed, followed up with explaining their understanding either verbally or in written form. The teacher described the situation this way,

... so it might be, Why [do] cotton balls swell? So I might say, "Here's your test. I want you to compact a cotton ball as hard as you can in your hand, and then let it go, and watch what happens and tell me why. Why in relation to ... this relates to so and so. Relate it back to that." So I'm testing what they remember, but also what they can actually put into words, and I get answers I don't expect. And they're right. And I get answers I expect. And they're right. You know. And if I get an answer at all, even though scientifically it might not be totally accurate, if it shows reasoning then they'll get marks for that. I say to my kids, "Very few marks are given for having the right answer." And so the test was not, What's the answer to this question? It was, "Do this experiment and then talk to me about it. Tell me what you think. Why do you think it happened? Well, how does that relate to what I told you about?"

This teacher found that student response to this kind of "testing" of their knowledge was more positive than that usually experienced by traditional testing. When students are given the opportunity to engage in a hands-on experience and explain their thinking in their own words, there is less anxiety. She stated,

And I can remember my principal at the time coming in and saying, "I cannot believe this." He said, "These kids are so *animated*." He actually heard kids in the hallway saying, "We're having a test in science tomorrow. Isn't that great!?" Because they knew the test would involve activities and their own thoughts.

Another teacher also used unconventional assessment procedures. He incorporated the popular television show "Who Wants to be a Millionaire?" into his testing. This teacher circulated around the classroom asking questions that students had prepared for beforehand, having been given old tests as study guides. When stuck on a question, students were able to use one of the help options available on the T.V. show which was "phone a friend" to see if they know the answer. Another unconventional paper and pencil testing method used by this teacher was to provide students with a choice of questions they could answer, such as "You choose the seven [out of the ten questions] that you want to be quizzed on."

Rubrics

Some teachers discussed using rubrics in their assessment. The majority of interviewed teachers used rubrics to some extent. As one teacher reported, "We use rubrics on some things and not on others." One science teacher explained rubrics were still fairly new to him as a form of assessment. He stated that he continued to experiment with rubrics and other forms of assessment. So far, he found that student anxiety was reduced by having expectations explicitly stated in the rubric and because the expectations were specifically stated, discussions with students about their marks were more effective, and although rubrics took time to develop they could be used again. In reflecting on how he was working on acquiring new assessment ideas, such as the rubric, this teacher stated that he had to work with the ideas over time to make them fit with his teaching beliefs and practices. He explained his experience with rubrics,

I'm struggling with different ways of assessing. I've made more in the way of rubrics this year. I've had some satisfaction with those results in that ... ah ... the

students have less stress performing to expectations. They're not surprised when they receive their grade and I don't have to debate them or tolerate their indignant attitude that, how come I have a 92 and not a 96. But rubrics, if they're designed well ... you have to spend a fair bit of time [to create them]. Granted they're recyclable. You could retool it from year to year, from course to course. ... It's new to me ... rubric assessment ... in science for the past three years. And I've had some success with that.

Peer Assessment

Peer-based assessment was another new approach to assessing student learning. Through peer assessment, students have the opportunity to measure the work of peers based on specific criteria. One science teacher compared his own experiences in using peer-based assessment to the perception he had as a preservice teacher,

... student-based assessment, where you have three people. You and your partner and myself, and we'll try to have a meeting of the minds. And when I was a beginning teacher I thought that was just destined to doom. The kid is going to argue for 100% and I'll argue for 50% and it'll just be a pain. I've not found that to be the case at all. I've found that the students are [harder] on themselves than I am. I have to beef them up a bit and say, "No, no, no, that was pretty good. I thought it was good.

Teacher Accountability

Each teacher interviewed was asked if the school division or school administration required a certain quantity of the curriculum or specific concepts to be addressed by the end of the year and if there were a specific number of tests or type of

testing and evaluative results that needed to be gathered. Teacher responses indicated that some school divisions were in the process of mandating certain requirements for student testing, while others reported that there were no specific requirements regarding curriculum coverage or testing requirements. When asked about content coverage and grading, one teacher said,

I can't say that I've felt any pressure outside of the pressure I placed on myself to ahh ... to cover the curriculum and to prepare my students the best that I [could]. No one has ever said to me, you know, you've got to have fifteen tests done by this month or cover so much content. ... And I believe there's a provincial standard ... one must cover a certain percentage of it. I don't recall what the percentage is, but I try for one hundred percent, but I don't get there.

It is interesting to note though, that discussion throughout the interviews included teacher talk about evaluating students' work and about grades. It appears that these activities are a major focus for teachers whether driven by expectations from administration or teacher driven.

One teacher reported that her school division was trying to get teachers onboard with what they referred to as "fair and balanced assessment". The implication of this concept would have teachers within each department in the school use the identical tests and exams for a particular grade level. Another teacher in a different school division mandating the same kind of assessment described the situation.

... we're on a big kick to do ... this year, to do what's called fair and balanced assessment. And one of the things they want is ahh ... things like common exams,

common testing within the department, within like ... everyone who's taking grade eleven chemistry is supposed to have ... everything the same.

Teachers in the science department of this school felt pressured to provide regular test scores under the requirements of this new mandate. They believed, at this point, that this was an intrusion into the way individual teachers teach and that too much time out of an already tight schedule was required to develop common quizzes and tests for all classes taking the same course. This teacher stated that this mandated movement to department-developed testing ...

Takes a lot of extra planning ... that maybe it takes away from teachers' styles and so we haven't implemented [it] a whole lot. ... we're pretty much forced to test at the end of every unit and have quizzes and things like that and so we do. We haven't gotten the common exams yet ...

There was also a sense that teacher autonomy was being threatened by this school division action. This teacher explained that teachers in the science department were a cohesive group respecting the strengths and differences of their colleagues. He expressed it this way, " ... we have a really good group of teachers and we all know where our strengths are and we want to try and keep it that way." In fact, this teacher felt that the differences among teacher interests and teaching styles offered students choice in terms of selecting who they wanted as their instructor. He explained ...

One of our guys, his strength is in elective chemistry ... Whereas I'm more of a bio-chemistry-organic type person, so we'll do esters and ... soap making and things like that. So we each try and play with our own strengths ... [it makes it a] little more difficult to implement [common tests] here. I think we give students a

bit more [of a] well-rounded approach ... the students can find a spot where they feel comfortable, where they like what's going on. It's good to have differences.

This teacher felt that the demands of the school division ran counter to the research literature. He referred to the early years concept of the emerging curriculum in which teachers follow student interests and what they already know. This is the way he would prefer to teach. The problem he foresaw with the "fair and balanced assessment" approach was that he will not be able to build on student interests and allow for student choice. In order for students to write department developed quizzes and exams, teachers need to ensure that they are teaching the same content. He described the situation this way,

What they're teaching at university [in the early years] is the emerging curriculum and letting kids lead the way and working with what they're interested in. You know we can't do that here so much, but we can in some ways. Like in our organic unit ... I say well pick something that you want to make and we'll see. [Students] get a chance to do it and research it and work through it and so in little doses we can do some of that. But if we went to common exams and common tests or doing the same thing for everybody, everyday

Although he had not heard it first hand from the school division, he reasoned that what was driving fair and balanced assessment was parental demands for creating equity among different teachers teaching the same course. He explained,

[Although] I haven't heard anything at the high school level, but I know from teaching [acquaintances] in different spots, it's parent-driven more than anything. Because they say, well, we have this person for chemistry and my daughter had

this person ... Why are they doing different things? Ummm ... why is it that his tests are worth more than this person's test? And things like that. They just want to try and make it so that when a parent ... It's the same test. Well, they all wrote the same [test], so it's a fair mark.

Grades

Several teachers indicated that grades rather than learning had become the focus or main purpose for many students engaging in their assignments. Some teachers stated that without a grade attached to an assignment, students failed to see the value in doing the work. A biology teacher suggested that "If [the work is] not for marks, there's no interest in doing it." Another teacher stated, "... they wouldn't do it if I hadn't said [I'll] take it in for marks." A science teacher stated, " Everything is for marks. It's really actually unfortunate, but there are enough kids who won't do [the work] if it's not for marks."

In responding to the need to have assignments marked to motivate students, one teacher stated that, for one class in particular, she began taking in assignments every day or every other day. Rather than providing a number or letter grades, she wrote comments on the paper, such as, "You're close on this one. You're missing these points." While this plan did motivate students to do the work, she found that her workload had increased. The result was that she spent a considerable amount of time marking. She explained her dilemma,

I was doing a huge amount of marking. It was a lot of work. This was my lighter semester, so I was able to do that. In a heavy semester, I couldn't do that.

Eventually the students wanted clarification whether the assignment was for

marks or not, and would she be looking at all of the papers or just randomly selecting some of them. Her response to the students was, "I'll scan it. If I see anything that looks obviously bizarre, I'll make a comment. But, I'm mainly checking that you've tried every question."

In an attempt to reduce their marking but assess how students were understanding the new material, teachers sometimes graded an assignment as done or not done, so that students did the assignment and knew it has been assessed in some way. This teacher indicated that:

Sometimes I'll tell them just, you know, you get either it's done or it's not done. But it's almost always for marks. ... Sometimes it doesn't have to be worth much but if you don't tell them that ... But you can't tell them that, you can't tell them this is not for marks ... If I were to give them a three day project and not grade it they wouldn't do it.

However, in trying out different approaches this teacher found that students would respond to an admit slip on which they wrote down their response to a question relating to their understanding of the previous class content. While this did not count for marks, she believed students participated because it was a short assignment and they could see a purpose in doing it. She explained,

Sometimes, when they come into class I'll give them like an [admit] slip kind of thing and I'll ask them to treat it like a test, but I'll tell them it's not worth anything. And I'll tell them the reason I'm doing it is because I want *them* to see if they know what I'm talking about and *I* want to see if they know what I'm

talking about and they'll take that very seriously, I find, but that's only, you know, a ten minute thing.

Teachers reported this phenomenon of students choosing to do only assignments that were for marks with displeasure. The general consensus was that students were more concerned about their number or letter grade than actual learning. Some teachers felt that because of the focus on grades, assigning marks to all assignments and projects had become a way to manage participation in the course, rather than engaging them for the love of learning. One teacher who was uncomfortable with this stated, "No, it's just managing the kids. Yeah, I don't quite know what to do about that because it is a little yucky."

Parental Demands

Parents in some communities exerted a strong influence on what happened in the school. For instance, teachers in schools of middle to upper class and fairly affluent communities found parents wanted to know what their children were learning in school and, in particular, what number or letter grade they were attaining in their various courses. "There is a tremendous amount of concern and interest in the community, What are we teaching? What are my children learning, and I want a number" one teacher stated. This teacher elaborated further by stating:

Grades are so important in this school. It's almost frightening. And that's a culture I'd like to change. ...Parents need marks. ... The culture of the school is that money is very important, and university is extremely important ... a lot of the parents [are] pushing their kids to go to university, even if the kids themselves may not feel they're ready. That's the culture. We [tried] with the grade nines ...

we sent out an interim report after about a month [after school started in the fall] so halfway through the first term. And we started it with no marks on it, with just anecdotal reports. And the feedback from parents was, "We need a mark." So, we switched to marks. The kids want to know if something's worth marks, and the teachers [now] say, "You have to do it because it's worth marks." ... It's definitely a very strong culture, part of our culture.

Teachers found that some parents were also concerned about marks on daily assignments and project work. They reported having parents request the opportunity for their child to make up low marks by doing an extra project or redoing a part of a project that reduced the overall mark. Some teachers commented that parents were generally not satisfied with marks in the fifty or sixty percent range, and would make requests for their child to have an opportunity to improve on this. One teacher explained that parents wanted to know all of the details regarding test content and marking criteria, and expected their child to obtain a certain mark or have the opportunity to better it if this was not achieved. One teacher referred to his experience,

They want, here's some tests, the criteria, that's what your grade is, you have this mark. And then if that mark's not high up they want to know what extra things they could do. ... That's something that I've struggled with a lot ... the difference between, for example, a seventy-five and an eighty ... What extra project can we do?

Some teachers reflected that the use of testing had become complicated, and questioned whether they value the use of tests or whether they are being pressured by

others to test. When asked why he used testing, one teacher replied, "I'm not so sure whether it's feedback for [the parents] or for me."

Teachers also felt conflicted by what they considered to be parental overemphasis on test scores and the myopic view that testing reflected a complete picture of the complexity of learning. A science teacher expressed the predicament this way, "If it's things that are more obtuse or more ... ahh umm less solid, I just have a hard time with [relying solely on test scores]."

The factor which loomed the largest challenge for many teachers was not surprisingly, time. Teachers often cited their constant surveillance of time as an ever present factor in their myriad of decision-making practices. While for the most part they did not feel continually under pressure in relation to time issues, they were constantly aware of how time placed constraints on their decision-making.

Time in Relation to Instructional Methods

Constructivist approaches versus traditional approaches. One of the decisions teachers faced when planning their instruction was to determine the instructional approach that would be most successful in helping students understand a concept and at the same time be the most efficient use of learning time. One teacher described how he conceptualized time in terms of investment, and when choosing an activity, evaluating whether the time required was in proportion to how well students learned the concepts. He related this to having a "clock ticking in his head all the time" and continually evaluating whether an activity paid "good dividends" and was "worth the investment". He reflected on an experience that had occurred within the last few weeks in his biology class, recalling a small group, heterogeneous activity in which students dramatized the

life cycle. On reflection, the teacher came to the decision that the time required for group members to share their ideas and knowledge and develop their dramatization was longer than if he had used a more traditional lecture approach. He explained, "And ahh ... for me, it seemed like I could have done more in much less time. ... So my dilemma is the alternative strategies, will I get a big enough bang for my buck?"

Even though this project had students fully engaged during the last week of classes for the year, and had drawn out one student who had been a passive learner, the teacher analyzed the overall outcome as being an ineffective use of time. He explained,

I don't think I'll do it again. The kids who did well, they really enjoyed it and they were clever. ... And ah ... students I never thought would enjoy it, did. And I was laughing, ... it was most entertaining and it was on topic for the curriculum. But the time that was invested and the number of groups that were successful, I wasn't happy with ... I wasn't satisfied with. I suppose you'll always have a few that aren't [successful] but that's the balance. It took this much time. What was the return on that investment? For some students, like this [Student A], I think it was huge dividends. He's not said diddly-boo all year long and was very quiet and a bit of a recluse. Then I put him in this group to do his performance and he, ... I thought he was a different boy. And so my dilemma is that for [Student A] that was really valuable and for two or three groups that was wonderful, but two or three groups out of ten, thirty percent return, I don't know ... If I had done it my traditional way, we would have done it in less time, and I would have been certain that they had seen and been exposed to and had a chance to manipulate it in some fashion ... all cycles."

Student-centered focus in relation to time. Teachers must also make decisions regarding the amount of time spent on topics before moving onto the next curricular topic. Some teachers stated that they were faced with choices regarding spending more time on topics students had become interested in or topics that were of current interest and the ever present concerns regarding time expenditure. One teacher described his thinking on this issue.

Often that teaching moment is more valuable than driving on to the next option in the curriculum. That ahh ... it's kinda like a road curve with my [own family], you know I can drive real hard to get to Edmonton in a day but no one's gonna be happy when you get there cause you're gonna miss all the fun stuff along the way. So that's what teaching is like, that if you don't stop and let the kids get out and look around and poke around at stuff ... that's what they're gonna remember on this road trip and remember in biology class. So when we take some time to talk about ummm ... gender politics in North Africa or the politics of gender determination, that's gonna stick with them. But here's another overhead of the digestive system ... no.

Time efficiency and cross-curricular timetabling. It was suggested that cross-curricular integration would be an effective way to manage time efficiency for students and teachers alike. One teacher perceived the value of cross-curricular projects at the senior high level as a way to enhance time efficiency for teachers and students and perhaps make the study of different curricular areas more manageable. He explained,

If I could find a way of getting my students credit in both science and English or science and drama, we would have, I suppose, access to twice as much teaching

time ... if I could have another curriculum area, to have another teacher agree to that. And the kids would get twice as much for their investment, too. That would be a big saving ... if we could get more cross-curricular projects and presentations going.

Limited Opportunities for Teachers to Meet

Several teachers indicated that there was little time for teachers to meet with each other to discuss areas of mutual interest or concern. The two most often cited factors underlying this problem were extra-curricular responsibilities and the demands on teachers' time in terms of instructional issues.

Extra-curricular responsibilities. Teachers indicated that in addition to their teaching commitments, they also carried extra-curricular responsibilities that occurred either before classes began in the morning, at noon time, or at the end of the school day. These extra duties and variations in scheduling often made it difficult for teachers to meet with one another. One teacher explained, "... teachers are, like I say, doing all these extra curricular [activities] ... or for myself ... I'm doing year book. I'm taking ... I'm heading up to take pictures of teams and events [after this interview]." With teachers working in different extra-curricular activities throughout the non-academic periods of the day, teachers report difficulty in finding mutually workable times to meet.

Timetabling. Another situation commonly expressed by teachers was the lack of scheduled-in common preparation times that would allow teachers teaching the same course to meet and discuss their areas. This also extended to division-wide networking of teachers teaching the same course. One teacher talked about the need for some "release

time” to enable teachers to meet and make plans, explaining what typically happened in his school,

... just bumping into a staff member in the hallway, “Hey, what do you think about this?” It gets a great warm reception, but they’ve got a musical to put on and a drama performance, and ah ... kids to pick up after school, and you’ve got teams to coach and pretty soon the idea is put on the shelf [with other] things that you’d like to do.

Teachers reported that professional discussions with their colleagues took place informally, on an ad hoc basis, sometimes with one teacher having a preparation class checking to see if the other teacher had a moment to talk. One biology teacher explained how she contacted her colleagues,

You know, sometimes it’s just randomly in the hall or one of us is on a prep. We did not have a common prep this year. It’s something we *request*, every department does, but we don’t always get it. And sometimes one of us will have a spare or prep, and check to see if the other teacher is busy. Sometimes half way through a class you might wander out [into the hall] because you know that other person has a prep.

According to one teacher, there was interest among staff members in his school about implementing cross-curricular teaching, he stated, “but there’s just no time”. He felt that the school could support cross-curricular planning by actively providing teachers with planning time. His suggestion was:

If they took one of the professional development days and said you know what, we want to give you the opportunity to do some team planning that’s cross-

curricular, and to facilitate that, we're giving you a half day. And here's your sign up groups and here's where you go ... that would be really beneficial.

Time required for activity-based learning. Time becomes more of a concern when teachers move to an activity-based, collaborative learning approach. This approach to learning requires more time than traditional lecture instruction. Lessons usually begin with the teacher activating or building background information on a topic, followed by students working in small groups to share their ideas and fulfilling a particular assignment. One teacher explained his experience in transitioning from a school with a semester system with longer blocks of class time to a school with the traditional timetabling of courses starting in September and ending in June, composed of 45 minute class periods five or six times a cycle.

In a ninety minute class it worked much better. I could go for thirty or forty minutes and then we could have some time to practice, do some problems, maybe some class discussion or have [students] reword or rephrase some points. ... so compare-contrast or some KWL's (Know - Want to Know - Learned). In forty-five minutes it's really hard to do. It takes me forty-five minutes to get there and then they leave and then they come in the next day, and it may not even be the next day. I may see them on Thursday and then I don't see them [again until] ... Tuesday.

D. Adolescent Culture

Student Achievement

Background and placement. Every school in which the ten interviewed teachers taught had students whose achievement ranged from low to academically gifted. Some

schools were located in fairly affluent neighbourhoods where parents valued a university education leading to financial success. Other schools were located in working class neighbourhoods. In one school located close to an industrial park, a teacher estimated that “maybe twenty percent [of the students] will go to university and try it out and probably only ten percent will stick with it.” She reported that, “We have a huge group that is what I’d call vocational, but I’d say maybe only half of our kids are going on to post-secondary something, [community or technical college] or something like that. Maybe half. But the others might go later.”

While economic status has traditionally been determined by where you reside in the city, this has been influenced in part by city planning mandates that have interspersed low income housing throughout the city for purposes of providing a more equitable income tax base for funding. Students from low income families now attend schools in catchment areas which have previously been predominantly middle or middle-upper class. The make-up of the student populations in these schools reveals that different catchment areas can no longer be defined simply by the economic status of the majority of the families living within its boundaries as in the past. Moreover, legislation for inclusion and the active recruiting of some school divisions to increase their enrollments through additional programming, including baccalaureate programs and programs for international students have created schools with diverse achievements levels and needs, and individuals who are motivated to achieve above and beyond personal circumstances as evidenced by examples provided later in this discussion.

The phenomenon that occurs among schools within the divisions in which this study was conducted, is that along with specialized programming within schools, such as:

IB (International Baccalaureate), and AP (Advanced Placement) for academically strong students, other programs are also offered to accommodate special needs students, international students, teenage parents, and young offenders. Thus all of the participating schools had students with a range of abilities, backgrounds, and economic stability. A chemistry teacher described his school's population this way,

We've got a huge mix. ... our school population is about 1,250. But we only have about 300 that are from the catchment area ... which is sort of a working class neighbourhood ... a lot of immigrant students from the surrounding area ... We have vocational here as well, we have health and child care and cosmetology, so it is a wide mix. But because we have the international baccalaureate we also draw in from [six other school divisions] so we have a huge draw for students ... We have even some students that are living on their own [who] come to school while working, to students who have the typical two parent family-type thing and access to everything they would want or need.

A biology teacher said, " Overview of the school: We have the range, all the way from modified students; all the way up to some amazing kids who are going to do some wonderful things; and everything in between." Another teacher described the students in his school this way,

So there are some kids that are very, very skilled and age and grade appropriate. Some even exceed that ... So within the twenty-five kids in my class, you have a spectrum of like from very, very low skill level to very high skilled level.

A teacher in one of the smaller schools described students in her school as,

... We have, I would say, a mix of socioeconomic levels. Like we have kids who I would call middle class, even upper middle class ... a handful of those, and we have a lot of pretty poor kids that come from the industrial area. We also have students from the [dance school] that come here to do their course work. We have visa students that come all the way from around the world, ... our visa students and our ballet students are strong [students] because they are highly motivated. We are probably one of the smallest high schools around, really. ... we also have a TAPP program (Teenage Parenting Plan Program), we have babies in the school, we have a CAP program, which is a life skills program, and we have the STEPP program which is for young offenders. We are really only about two-seventy. ... we have [an affluent area] just over here, which is small, but you know the kids come here or they, a lot of them go to private schools ...

Worthy of note is that the top two performing grade twelve students at this school were females whose life situations would not typically place them as academically successful. As the teacher indicated,

... well our top student this year, who will probably win, clean up on all the awards, is a mom. Like she's in our teenage parenting program, and she's living by herself with her child and she's pulled this off. And our second best student comes from a pretty poor family ... and they are both going to university. Well, one's going to [a community college] into nursing and the other is going into nursing at [the university level]. It's interesting.... I think the mom was always like this, you know, and she kind of made a mistake. The other girl, see I didn't realize until this year that in fact she came from a home where she was bitter ...

struggling quite a lot because she's just highly motivated ... strong writer ... strong reader ... just yeah, gifted, really in some ways.

Classroom size and make-up. Classroom size varied across schools. Teachers preferred working with smaller class sizes, considering groups of thirty-two to be too large. Teachers mentioned having classes as low as fifteen to nineteen students, and as many as forty students. One science teacher considered his class of thirty-two students to be too large for the science lab, in terms of too many people in the available space, and too many students for him to circulate among while they were working. One geography teacher commented, "I had a very nice, lovely class of nineteen and a very large class of thirty-two ..."

Course selection influenced both classroom composition and size. In terms of course selection, students are required to take certain courses to meet credit requirements for high school standing and prerequisite courses for university programs. This was particularly evident in grade nine and ten (S1 and S2 levels). History and geography are required courses in grade nine and ten, regardless of a student's future career choice. Thus teachers of history and geography expect to meet a range of student abilities in their classes. In describing the students in her school, one geography teacher reported that, "We have a huge percentage of at-risk kids, and I have them all because my courses aren't streamed." This teacher found that a heterogeneous mix of students carried immense implications for the classroom teacher. She explained, passionately, "*Ohh. Yes. Yes, because it's a nightmare really. You know you get kids who can't read and can't write and they are all in the same class. Yeah. Yeah. There is very little streaming that occurs.*" She described the challenge in teaching senior 1/ grade nine geography.

... geography is more difficult because it's a content area course and those content area courses are harder to modify in a sense, or adapt.

Recently, changes have been made to the required courses in science to meet high school accreditation. As of 2003, only one science course has been offered at the grade ten level, considered to be a foundations course. This course is required to obtain a high school diploma. The intent of this science course is to provide all students with a general background in all of the main subdivisions of science. One teacher referred to it as a "kind of buffet, a little sampler of different science areas" offering some physics, some chemistry, and some biology. The effect of moving to only one grade ten science course changed the student composition of classes, with commensurate implications for teaching. Now student ability levels in grade ten science stretch across a broad range. One of the interviewed teachers highlighted the challenge indicating that "[Students] have abilities that cover the spectrum, from those who have trouble reading the text and vocabulary to other students who are not challenged enough by it."

Another change to previous course requirements occurred at the grade eleven level. Students must select at least one science course to earn their high school credits. The provincially selected choices are physics, biology, and chemistry. Students planning to enter a specific career and needing to meet university entrance requirements, or those keeping their options open, often take more than one science course. For the majority of students who are not planning to attend university after high school, biology has become the preferred science course. The resulting situation is that some classrooms range from university-oriented students to those who take biology to fulfill their basic high school credits.

Sometimes course selection and timetabling influenced the make-up of classes. One teacher found that in her school, the majority of the more academically focused students took music as one of their credits, as well as biology. Since these students were together for music class, the music timetable determined their biology slot. According to this teacher, "Music students will very often be lumped into one group, and they tend to be more academically able in our school." The remaining biology slots are then allocated to the other students. The end result at times is a whole class of academically strong students or a whole group of low-performing students. One teacher explained the resulting situation in her school,

So there's a bit of a difference. In the biology class we have a very unique phenomena in the school called an inverse bell curve. We have some high-end students, and we have some low-end students, and we have very few students in the middle ... This year there are three grade twelve classes ... the other bio teacher, in his first semester, had a perfect inverse bell curve. This semester he got the top end of the bell curve, and I got the lower end.

Another phenomena that existed was that the courses students select in grade eleven and twelve (S3 and S4 level) had a streaming effect. Students planning to attend higher institutions of learning need to take certain similar level and prerequisite courses. A geography teacher explained how streaming due to student course selection occurred in her school, "... some kids will take pre-calculus math, and therefore you know they are going to all be in the section that is upper calculus math."

In another school, one chemistry teacher commented on how the enrollment of IB students influenced the composition of the other grade eleven classes in chemistry. This

year, in his school, the IB students formed one small class. Students who were not in the IB program were then grouped together to take the regular chemistry course, resulting in a class with students of varied abilities. He explained, "So if you weren't taking full IB, they put you into regular chemistry. So I had some students who were IB capable, then I also [had health and child care people], and so you get everyone in your classes."

Another issue of significance, related to the IB program, was its effect on the other non-IB students in the same grade. IB classes are typically smaller than other classes, while student achievement is high. With one teacher assigned to a small group of IB students, teaching manpower is stretched to meet the general and other university bound students. These classes then become larger and composed of a wider range of abilities. One teacher explained,

Some of the English [classes] this year got up to around forty. And that's one of the biggest things ... because we offer IB we use so many teacher units. My grade twelve IB's next year ... I'll probably have twelve to fifteen [students] and so because we [in the IB program] have some classes that are smaller the other [class] numbers get pumped up.

Issues of Adolescence

Several issues were discussed during the interviews that revealed glimpses into the lives of today's adolescents.

Part-time jobs. Students working at part-time jobs, regardless of their economic background was commonly reported by teachers. From the teachers' perspectives, these jobs served as a source of income providing students with financial independence and purchasing power. As soon as students turn sixteen, the legal working age in this country,

which is grade ten for most students, they begin to take part-time jobs. Many students find employment over the summer and a large number carry on with part-time jobs throughout grade eleven. One of the science teachers interviewed approximated the number of working students to be,

I'd say for grade eleven maybe thirty to fifty percent, grade tens, they're just starting to [work], maybe ten percent. By the end of this summer, they'll all be getting jobs and quite a few carry them through the next school year. ... I think it's what they want. A kid wants to have the best clothes or to be able to purchase what they want when they want it. I don't think as many of them are suffering for not having the designer shirt ... they're all ... I think it's they want to buy whatever. ... And kids do notice who's wearing this top or who's wearing that and who's got this purse. The name doesn't matter.

The need to work for some students seemed, however, more related to peer pressure. Another teacher commented, "A lot of the kids work, again, because of money being important at this school. If your family is not financially well off, you have to work to catch up with your friends." Another teacher reported that in one of her classes every student was holding down a part-time job. Many of the students were working at jobs in their community, mostly restaurants, fast food places, the nearby Cineplex and a skate shop "So there's a range."

This teacher had the impression from talking with students that employers often were not considerate of the age of these students and the fact that they were still attending school. Her perspective was that they generally disregarded the fact that these adolescents were just high school students and that education should be the priority in scheduling

student work hours. She explained, "Some of the employers treat high school students quite badly and give them way too many hours and will not let them drop a shift if they need to study for something."

Workload. There was an acknowledgement among some of the interviewed teachers that students who were keeping up with course work and assignments in their different subject areas were burdened with heavy workloads. They often appeared to be overwhelmed and showed signs of stress. One science teacher noted these observations,

... they're carrying a heavy load and ... I can't say that I've heard anything expressed overtly. I think there's a fair bit of subvertive pressure if that's the correct word, that's all under the radar I suspect. It's there 'cause when I see the kids crash ... 'cause they're flying so low. For example, you're returning a test and a student's got a seventy-two or a seventy-four percent and they have a total melt down. "Well, I gotta do better than that." Then they go one of two routes, it's like ohh I'm stupid or the teacher's a "meanie" ... one of the two.

Time. Through their observations, some teachers believed that students were trying to accomplish too many activities beyond attending school full time and related some of the students' anxiety to this. In addition to part-time jobs some of the students are expected to help out at home while others are engaged in other activities. One teacher stated, "The kids also have a lot of extra-curricular [activities] that they're doing, so time constraints are, again, really hard to deal with." One teacher felt that the demands on students' time outside of school was affecting students' ability to spend the time needed on schoolwork. He has experienced situations when students became distraught after receiving their test back,

Is it realistic to expect a ninety when you're carrying on a part-time job, you're looking after your siblings at home and you didn't study 'til the day of the test? Is it realistic to expect a ninety? But I've seen more students this year that have had an bit of an emotional crash and then are just sobbing over something.

Teachers also reported that students had a difficult time completing homework. Senior years teacher remarked that the after school life of teens was filled with other interests or responsibilities and that expecting students to complete homework was a problem. It's kind of frustrating. He explained, "Here's the thing ... there's a billion other things they have to be doing, they want to be doing, but they shouldn't be doing, I guess. And homework is not it."

One teacher described an incident in which school-planned activities affected the ability of one student to keep up with his schoolwork. While this student who was described as "low functioning" had been making an effort to pass the course, the teacher noted that some planned field trips set him behind. The teacher elaborated,

... one student I have in class who is so *low* functioning, and he was passing until he, I think, got over-stressed about a month ago. And he just he just had too much pressure. He had three field trips out of the school, got a week and a half behind in all his courses, and then he just couldn't catch up. So, him, I'm going to lose.

Dropping out. Several teachers mentioned that while the numbers were generally small, students as young as grade nine were dropping out of school. One teacher reported that an unusually high number of grade nine students dropped out during first semester this year. She stated,

I mean I [had] grade nines first semester this year, and I lost five of them in two classes, but grade nines, they are only thirteen [years of age]. So, that's pretty high, but then it seems to drop off. The drop out rate ... if they get through grade nine they seem to hang in there.

From the teachers' perspective, causes for student drop-out were not clearly discernable. While students who quit school before graduating could be those with low achievement, this was not always the case. Teachers reported that academically strong students have made the decision to stop attending school as well. One teacher reflected,

I'm thinking of the five kids I had drop, I would say all of them, yep, I would say all of them were really bright. Some kids are bright and are still struggling readers and writers, but not one of [these students] was a struggling reader or writer.

This teacher explained her perceptions,

I'm not sure if I [can] generalize ... but in this particular group of kids that I lost, [they] were all supported by their parents ... and I think financially and also their parents wanted them to be successful. That's on the surface. You never know what the under currents were at home.

Based on his experience at the high school level, particularly in the discipline of science, one teacher stated that lack of school success causes some students to leave school before earning enough credits to graduate,

I've found that grade eleven ... It's hard on them ... they've been doing really well and perhaps a little misleading in that the [Grade ten science] course wasn't quite as rigorous and now they're suffering some defeats. ... [Grade] eleven is a tough year for the kids. ... I find eleven is when many of my students meet with

failure or poor performance something less than the eighties that they've gotten in the past. There's a few students who fail in grade 10. Some of them are ESL ... it's a language issue, and they may achieve an ESL credit where the requirements are not as rigorous ... provincial standards don't apply or can't apply the same way. But the transition from junior high to high school is tough on a few of the tens and they usually lose credit because of withdrawal from school [or] they start skipping.

With cautious reservation, several teachers perceived from past experience that family difficulties was a major cause for students dropping out of school. One teacher stated,

I think in a lot of cases it's family troubles. ... I know that two girls talked a lot to me, they were mad at their parents, but I'm not sure what fourteen year old isn't either, you know. It was hard for me to know that. I would say that in one family, there [was] a really negative relationship at home. ... It's about power I think. ... in a couple of the situations it [seemed] to me that the parents were lost for what to do ... kind of the "out of control kid". It's not that they had anger issues necessarily, they just [decided], "I'm not doing that," (laughs). You know, "Make me." Right? So the parents didn't know what to do. Well, [the student] just wouldn't [attend]. Just wouldn't come, and then once they were behind, coming back the next year [would be] embarrassing ...

Another teacher explained,

... [one] girl, ... she had a lot of home difficulties and so I can tell she wanted to be here to be social and to find a niche and do it that way. It depends a lot on the situations too, I guess, ... but generally, ... it's more like home life carrying over [into] school."

Teachers reported that some students seemed to lose interest in school and were no longer motivated to continue attending. It appeared that for some students there was a wide gap between what school had to offer them and their current interests. One teacher described a situation in which a student left school to follow a career interest. The teacher explained,

She's general academic, but her big goal and she actually ran away during the school year in the first semester. She wanted to be a singer and that's her thing. ... So you know that's something that she's gotta decide and work [on] with her parents and do it that way. But yeah, she took the family car and went to [British Columbia]. Just [to] go out and sit on the beach and sing and practice, but that was her.

Another science teacher commented that the decision of two students to drop out of school "... was more a matter they just really didn't want to be in school anymore."

The perspective of another teacher was that students whose performance was low in high school had been weak students throughout their schooling and this needed to be recognized in the form of instructional support and teacher flexibility and understanding. Based on his experience, he explained,

Unfortunately ... they tend to fly through the cracks a lot. They're [often] weak students to start with and so they need the help. ... You know like from a personal

standpoint. ... I try to make sure that they know they can come here and they can get help. And it's offered to them and you just gotta make it welcoming enough for them to come and stay. You know, and that's the big thing. I know I've had kids transferred into class that other teachers could not get along with. But generally those are the ones that won't bend ... "We gotta stick with the rules. We have to have it standardized. It's gotta be this way." Whereas, I run a little different classroom environment where it's more open ... so the kids like it better.

Support services. Support services and how they were accessed varied from school to school. Some teachers mentioned a lack of support services for students who were struggling academically. Para-professional support varied in the schools. The policy in one school was that students with modified programs received para-professional support. In another school with a student population of 1,250, there were only two resource teachers. This was a school that offered a range of different programs from IB to vocational. A chemistry teacher had the assistance of a para-professional for the first time this year for five students in his class. The teacher stated,

I had one this year but he was only for half the year ... He was actually here to cover actually five students. I guess they have a hard time finding para's or teacher assistants who know science and feel comfortable coming into a chemistry class and working in it. 'Cause that's the first time in the six years I've been teaching, and the eight years I've been around that I've heard of having an assistant in to help [in a chemistry class]. ... He was really good. He knew his stuff. But ... he got a job offer about halfway through the year and that was it. No replacement. He would hang out in the groups with the kids [and] was able to

work with them. And many of them were just ESL or international, so that's kinda why he was there. ... He was a great help, so then I could circulate and spend more time with the students, too.

Some teachers called on the support of guidance counselors in their schools to follow-up on their concerns about both academic and non-academic issues. At mid-term report time in one school, a biology teacher contacted the school guidance counselors with a list of fifteen out of a class of thirty students concerned that they may not pass the year. The guidance counselors met with the students individually and discussed their options with them. The teacher's account of the events was as follows,

I was concerned that they would not make it ... get a credit in this course. So about midterm ... they [were] spoken to by [the guidance counsellor]. I think [that] was the wake-up call. ... They would have brought the kids in and had slightly different talks with all of them. One of the talks with the under performers, who have the *skills*, was: "Would you like to take this [through] correspondence?" And, that apparently motivates, "Oh, no, no. I'm going to try harder". Other kids got a wake-up call. "You need this to graduate. Do we need to come up with an alternative solution?" So then I had a lot of kids panicking, "When can I come in for help?" And, I think the concern level was raised a little bit. And, then there was a lot of extra help during lunch time and my preps, and just a lot of contact with home. I now have two kids who are failing, one of them I don't think will get the credit, and the rest should.

After meeting with the guidance counsellor and obtaining help outside of class time from the teacher she reported that these students had applied themselves and the

majority passed or even exceeded the pass mark. She reflected that low performance should not be immediately attributed to lack of effort or ability. She believed that each student's learning should be analyzed individually and that changes must be made based on individual needs. The teacher described the situation.

Some of them ... have been studying like crazy ... and they work very hard...Some of the weaker students are not necessarily lazy. I know some of them might get that way, if they find it too frustrating. No one wants to do something they can't do. Ahh ... This class was unusual. I would say of my thirty kids, ten of them could of done much better from the beginning. Of the five that were struggling, we started to talk about what they could do. For one kid, it was just come to class, because his attendance and his lates were unreal. And he was missing most of the material, and he couldn't figure it out. One student came in for help for half an hour, and did wonderfully on the test. He was getting in the ... he got fifty on the last test, and seventy-five on the one that he came in for help. So he thought that was wonderful. You come in for help, and fix up these little problems, and everything gets better.

Another teacher indicated that he called on the support of the school counselors when he suspected students were dealing with some kind of personal issues that might be interfering with their academic performance. One chemistry/biology teacher explained how he worked with the guidance counselors in his school.

[Support from the guidance counselors] It's been very good in this school, yeah very good. And I've interacted with the counsellor and with the student. And I've [contacted] the counsellor [about] a few kids in terms of ... you know, that

something doesn't seem right, something smells wrong here, and [I] put them onto it to discover what's ... what's going on. And sometimes it's been some really significant things, in other cases it wasn't so significant after all, but they've been good about that.

Teachers report that parents' reactions vary in response to finding out that their son or daughter is not performing well in school. Some parents became more overtly involved in monitoring their child's work. One set of parents began connecting weekly with the teacher as in this case, "I have one set of parents, they e-mail me once a week, and I e-mail a progress report." Another set of parents decided to establish structured study times for their child, as the teacher reported, "But, I have one set of parents, who ... they've kind of set up study times in the evening, and [are] still helping him along. He will pass." Other parents reacted with surprise and sought suggestions from teachers, "What's going on? ... Should we get him a tutor?" Some parents decided to become more involved in their child's daily assignments, "I'll check to see his work." There are also other parents who considered it their child's responsibility to do the work and pass the year. The teacher explained,

There's a lot of parents, though, by grade twelve, they want their kids to start taking responsibility. So I know at least one parent said to her son: "You know, this is your life. This is very hard for me. I will support you, but this is yours."

And at that point, I think the student said, "Ohh. It's up to me now."

Attendance policies. While many schools had attendance policies that restricted the number of student absences to qualify for high school credit, several schools allowed students to attend irregularly. A science teacher stated that one of his general stream

students had missed approximately twenty-five out of the total eighty or ninety classes for the year,

... and she still [attended] right up 'til the last day. She came and wrote her exam, she got ... ended up with like thirty-eight percent in the course. But she still came and she still participated when she was here. But no, it wasn't like she [made] any effort in studying or anything like that.

While students who had not met the attendance requirements were not allowed to pass the course, they were still welcomed to participate in some classrooms. Teachers who had this kind of policy thought that even sporadic academic classes were better than nothing at all and the least they could offer was a welcoming social environment.

Summary

In Part 1 of this chapter which was quantitative in nature, teacher responses to a questionnaire were analyzed to determine the predominate teaching approach of content area teachers in the middle and senior years, and to determine the kinds of cognitive text-processing strategies they use in teaching social studies and science. Statistical analysis revealed that instructional approaches were a mix of the predominant approaches conceptualized in Straw's model (2002), represented by three clusters: high scaffolding – high collaboration – high/low transmission; high scaffolding – low collaboration – high/low transmission; and low scaffolding – low collaboration – and low transmission. Teacher application of cognitive text-processing strategies in the content areas seemed relatively minimal, with more before reading strategies used than during and after reading strategies.

Part 2 of the study (qualitative) focused on identifying ten of the teachers whose questionnaire responses indicated high use of scaffolding and collaboration in their instruction. These are indicators of a social constructivist approach to teaching. Interview data provided further elaboration about teaching and learning from the perspective of these teachers. Themes revealed impressions of their knowledge and beliefs, as well as aspects of their instructional programs and their perceptions of adolescent learners. While these themes cannot be generalized, they do provide insight into how theories and research-based best teaching practices are being implemented in content area classrooms. Responses to the research questions will be addressed in Chapter 5.

CHAPTER 5

Summary of Findings and Conclusions

The focus of this study was to identify the most predominant instructional approach and cognitive text-processing strategies used by middle and senior years content area teachers of social studies and science and to gain insight into their classroom practices and challenges. Organized into two parts, the first part of the study required teachers to complete a questionnaire responding to demographic characteristics, as well as their use of instructional approaches or concerns and cognitive text-processing strategies. In the second part of the study, ten of the teachers whose practices were high in collaboration, scaffolding, or a combination of the two, were interviewed. A summary of the findings, for Part 1 and Part 2 of the study are presented next.

Summary of Findings

Part 1: Quantitative Analysis

The quantitative findings from Part 1 of the study indicate that:

- Middle and senior years content area teachers were experienced or veteran teachers, middle-aged or slightly younger, male or female, with a Bachelor's degree.
- This sample of teachers used a combination of approaches that while involving transmission was predominantly high scaffolding, high collaboration (38.5%) or high scaffolding, low collaboration (35.3%). Just over 25% (26.2%) of the teachers in the sample used a combination of limited amounts of scaffolding, collaboration, and transmission. This finding was verified by teacher ranking of

the thirty items describing instructional approaches and teaching concerns, which indicated that teachers used a mix of all three approaches.

- Teachers used more before reading strategies than during and after reading strategies regardless of instructional approach.
- When clustered, teaching approaches (high scaffolding-high collaboration-high/low transmission, high scaffolding-low collaboration-high/low transmission, and low scaffolding-low collaboration-low transmission) and use of cognitive text-processing strategies seemed not to be related to demographic profile characteristics (educational level, year of graduation, years of experience, gender or age).

Part 2: Qualitative Analysis

Findings from interviews with ten of the teacher participants who incorporated scaffolding and collaboration into their instruction showed that:

- The interviewed teachers were knowledgeable in their subject areas and continued to keep up-to-date with current pedagogy and discipline-related knowledge.
- Teachers were focused on instructional planning using creativity and flexibility to engage students in personally meaningful ways, and to differentiate instruction as well as assignments to meet the varying needs of learners.
- The transmission approach described by teachers was in effect an interactive approach in that students were no longer passive learners as teachers guided and directed learning.
- Rather than following a textbook to guide instruction in their content area, middle and senior years teachers in both science and social studies used multiple sources

of information including the Internet, historical accounts, government publications, real life stories and newspaper articles.

- Interviewed teachers used both homogeneous and heterogeneous learning groups.
- In addition to short tests, teachers used assignments and projects to determine final grades.
- The challenge of using time efficiently was an on-going consideration for teachers, even to the point of using a transmission-lecture approach to teach more content in a shorter amount of time.
- Legislation and school division policies have resulted in schools that have students with diverse abilities, needs and cultural/ethnic backgrounds. Best practice teachers plan differentiated instruction but are sometimes hampered by classroom size that makes scaffolding and collaborative practices difficult to implement.

Conclusions and Discussion

A summary of the conclusions is found in the accompanying Table 5.1.

Part 1: Quantitative Analysis

Predominant instructional approach. The statistical analysis indicated that teachers participating in this study used instructional approaches that were not mutually exclusive, they scaffolding student learning, used collaborative groups as well as interactive transmission. Neither a wholly traditional transmission model, nor a scaffolded, nor a collaborative model as described in the literature prevailed. Rather Straw's conceptualization of different levels of scaffolding and collaboration with the

addition of levels of transmission seemed to operate along a continuum and more accurately reflected the instructional approach used by teachers in this sample.

Survey data indicated the following about:

Demographics

Middle and senior years teachers generally:

- were experienced or veteran teachers, middle-aged or slightly younger, male or female
- had a Bachelor's degree
- were experts in their content area subjects

Instructional approach

- while teachers used a combination of scaffolding, collaboration and transmission the traditional transmission approach seems to have evolved into an interactive approach with students being more actively engaged as learners

Cognitive text-processing strategies

- teachers used more before reading strategies than during and after reading strategies
- cognitive text-processing strategies continue to be applied sparingly in content area subjects
- multiple sources of information have replaced textbooks and may have an influence on the use of cognitive text-processing strategies

Interview data suggests that:

- teachers using social constructivist approaches in their instruction share characteristics related to best practices
- teachers spent considerable time planning their instruction to meet different learning styles and ability levels, and to develop activities that engage students and build their conceptual knowledge
- students were often involved in projects, activities, and assignments that allowed them to process content
- teachers used homogeneous group learning for brief activities involving same ability learners; while heterogeneous grouping was used for projects extending over time and that supported struggling students with higher level and strategic thinking being modeled by the academically stronger students in the group
- paper and pencil testing was used in combination with projects, assignments, and research for determining final grades

Challenges and concerns based on interview data:

- time was a constant factor in teacher decision-making related to instructional planning and in meeting with other teachers
- teachers felt that concern for grades was eclipsing the importance of learning
- teachers pursued their own professional development needs and interests through the internet and networking with others in the field
- school or divisional initiatives need to be revisited to assist with implementation

Figure 5.1. Summary of conclusions.

Teachers reported their most frequently used instructional strategies were: circulating around the room to help students as they worked (scaffolding), having students work collaboratively in small groups (collaboration), involving students in projects and activities (collaboration) while often using some form of testing at the end of units (transmission). Teachers' attention was on meeting the learning needs of their students using Gardner's (1999) theory of multiple intelligences and student strengths (whether they learned best through visual, auditory or kinesthetic channels).

Of note, however, is that the traditional transmission approach seemed to have undergone a metamorphosis. Rather than simply transmitting knowledge, teachers were engaging students interactively in the content being discussed. As well, interview data revealed that the descriptions teachers used to explain their approach to lecturing, involved implicit social constructivist practices. So that while teachers structured their lessons and guided the direction of teaching and learning, they concomitantly assumed an interactive stance and engaged students in learning by using graphic organizers to guide discussion during their "so-called lectures", accompanied their lectures with interactive activities, and modeled and demonstrated note-taking by using fill-in the-blank overheads. In addition, using this kind of transmission allowed teachers to maintain control while at the same time respond to questions and clarify misconceptions about content. This interactive transmission-style instruction also helped teachers use time, a precious commodity, effectively.

What seemed to be driving instruction was content knowledge together with beliefs about how students learn, empathy for learners, and efforts to make personal connections based on student interests, talents, and motivation in relation to instructional

activities, as well as tradition or what Raphael (1984) called the historical-cultural context, the way in which teachers, themselves, had been taught.

Cognitive Text-Processing Strategies

Differences in teacher use of cognitive-text-processing strategies were revealed. Teachers in this study used before reading strategies more often than during reading strategies and after reading strategies. From the list of 37 comprehension strategies only a relatively small number were used regularly by the content area teachers surveyed. The most often used before reading strategies were activating or building background knowledge, using analogies to link familiar with unfamiliar concepts, and using questions to focus reading. The most frequently used during reading strategies were questions to guide reading, identifying main ideas to use later in summary writing, and the use of visual imagery to create meaning and make connections to what was being read. The most frequently used after reading strategies included providing feedback to students and having students write about concepts to show what they understood.

Another interesting finding was that science and social studies teachers were not using textbooks, preferring instead to access multiple sources of information such as newspapers, news magazine articles, government publications, “historical” accounts and the Internet to make the content more meaningful by providing contexts with which students could make connections and that reflected real world information and application. In their observations of middle and senior years content area classrooms, Pressley and his colleagues (2004) found that teachers spent considerable time planning and organizing their lessons, “being well aware that students could not and would not

learn the content from texts” (p. 423). The need to teach cognitive strategies for processing longer discourse in a linear fashion therefore seemed less urgent.

In several cases, textbooks were not used because they were outdated. Draper and Siebert (2002) found that the commonly-used content area texts that pre-service teachers had studied during their certification years sometimes used 30-year-old research to suggest, for example, ways to solve mathematical problems, techniques that were not commensurate with current theory in the field of mathematics education. In addition, shorter pieces tended to be less inhibiting to read and reread for meaning. Internet text also offers the opportunity to seek more information on a topic simply by clicking on an icon. Teacher competency in a subject area seemed to preclude reliance on textbooks to guide instruction and allowed teachers to focus on student learning by being creative and flexible in their teaching.

In addition, some content area teachers dismissed the idea that they somehow must share in the responsibility for teaching text processing. That, in their view, was the purview of the language arts teachers. Further, not all cognitive text-processing strategies are effective across all disciplines and all text. One of the reasons that teachers in this sample failed to use cognitive text-processing strategies may have been related to difficulties applying the strategies to their own particular subject matter (Draper & Siebert, 2002). In fact as suggested by Sweet and Snow (2002) and by Raphael (1984), effective literacy instruction depends on the content being studied, the texts, the contexts, and the characteristics of the learners in the class as well as the historical context. One of the problems in making cognitive text-processing strategies effective in content subjects is not only that literacy educators lack sufficient background knowledge in particular

content area disciplines, but also that they may be unfamiliar with the relevant subject area terminology and texts. Literacy educators, as a result, may lack credibility with content area teachers.

While the contribution of cognitive test-processing strategies to develop competent and independent readers continues to be promoted in the literature (Duke & Pearson, 2002; Klinger & Vaughn, 1999), based on findings from this study, the use of cognitive text-processing strategies is still not receiving sufficient attention from content area teachers. Interviews revealed that content area instruction seemed to relate more to historical-cultural factors as conceptualized by Raphael (1984) in that the learning strategies that teachers employed seemed to relate back to their own personal experiences with schooling as well as their own strategies for learning.

Instructional approach in relation to cognitive text-processing strategies. The instructional approach employed by teachers (high scaffolding-high collaboration-high/low transmission; high scaffolding-low collaboration-high/low transmission; and low scaffolding-low collaboration-low transmission) was not related to the use of before, during, and after cognitive text-processing strategies.

Relationship between teaching approach and demographics and between cognitive text-processing strategy use and demographics. In analyzing the relationship between teaching approach and the demographic items studied (highest educational credential, year of graduation, years of teaching experience, gender and age), no statistically significant relationships were found. Similarly, no statistically significant relationships were found between demographics and use of cognitive text-processing strategies (before reading, during reading, and after reading). That is, the use of cognitive

text-processing strategies seemed not to be related to educational level, year of graduation, number of years teaching, gender or age.

Part 2: Qualitative Analysis

Shared characteristics. These teachers had in-depth knowledge about their subject area, were life-long learners, exhibited a strong sense of caring and empathy toward students, implemented instruction and activities that were highly motivating, offered students choices, structured lessons so students understood what was required which allowed teacher to circulate around the classroom to monitor learning and provide feedback, and adjusted instruction to meet individual needs. All teachers shared the belief that instruction needed to connect with students in personally meaningful ways through relevant materials and real-world activities and assignments. Emphasis was placed on thinking, over the need to find the correct answer. Teachers made their instruction interesting for themselves as much as for their students.

These characteristics were commensurate with those identified by Ruddell (1995, 2004) in his studies of influential literacy teachers. In his study, Ruddell identified beliefs that were shared among these teachers. It is interesting to note that several of these were present among the interviewed teachers, including: empathy for the learner, monitoring and providing feedback during learning, in-depth knowledge of teaching area, use of highly motivating and effective instructional strategies, exhibiting a strong sense of caring, as well as adjusting instruction to meet individual needs. Teachers need to be supported in pursuing these ideals.

The instructional practices described by the ten teachers who were selected to be

interviewed revealed best practice teaching in addition to their use of scaffolded and collaborative approaches. Interviewed teachers planned in advance with considerable time spent on: content presentation, meeting different learning styles and ability levels, and locating and researching content materials including the Internet. Knowledgeable about their content area, these teachers were able to focus on the learner and to be both creative and flexible in their instruction. Teachers employed activities that engaged students and helped them to build their conceptual understanding. Direct, explicit instruction was used by teachers at times to model and demonstrate new learning and then provide students time to practice with teacher feedback and support. At other times the inquiry method was used but always embedded within a supportive instructional plan. Teachers offered student choice to make learning more personally relevant.

Students were often involved in projects, activities, and assignments which allowed them to work closely with the content/concepts and thereby construct their understanding individually and with others. As well assignments and activities involved students in a number of the language modes (listening, speaking, reading, writing, viewing, and representing) that contributed to their learning. These teachers found that lower performing students were often able to demonstrate talents and understanding when given the opportunity to communicate through means other than paper and pencil.

Interviewed teachers used collaborative group learning as a regular part of their instructional program. Teachers determined that homogeneous collaborative grouping was most effective for short term, similar ability learning situations; while heterogeneous grouping provided struggling learners with higher level thinking and support when

grouped with more academic students. However, it was also discovered that collaborative grouping was not successful with all students. Some students relied on other group members to complete the work, while other students preferred working independently.

Teachers indicated that they were experimenting with alternative assessment forms such as rubrics as well as peer and self-assessment. Rubric assessment was used periodically by teachers, but seemed to be at the trial stage. On the positive side, teachers found that rubrics lessened student anxiety and made grading more transparent, reducing student inquiries about marks. The time required to construct rubrics was a concern, however. Teachers also found that students were often their own worst critics when assessing themselves, grading themselves lower than the teacher would.

Concerns and challenges facing content area teachers. While teachers did not feel pressured by time per se, they were always aware of it in planning their lessons, determining when to stay on a topic, address current affairs issues, or move on to the next topic. Time was also an issue in meeting with other teachers. Social constructivist-based instruction allowed time for teachers to activate or build background knowledge and then engage students in related activities to process ideas and build understanding. Depending on the school's scheduling plan, teachers found that the traditional forty-five minute class was too short to follow through on this learning cycle. Teachers also noted that experiential activities did not necessarily guarantee success for everyone, although these opportunities sometimes "drew out" students with previously unrecognized abilities.

Evaluation of student work and the assigning of grades was a major concern for teachers, seemingly driven by changing student dynamics as well as demands outside the classroom—divisional requirements and parents. In terms of school division policy, a

new mandate referred to as “fair and balanced assessment” required common tests and quizzes to be administered across some school divisions for same grade subjects. This initiative lacked teacher support for several reasons. Teachers felt that: (1) their professional autonomy was being compromised, (2) implementing different instructional techniques would be curtailed in favour of uniformity, and (3) differentiating instruction to meet student interests and needs would be undermined.

Several teachers reported that in response to student decisions to undertake only those assignments worth marks they now used grades to motivate assignment completion. Teachers were uncomfortable with students choosing to do only graded assignments since non-graded assignments were opportunities to practice and spend time working with content. To the teachers, grading all assignments and projects placed more attention on management than learning. New incentives to ensure assignment completion were: responding to student work with brief, feedback comments; grading work simply as completed or not completed; and using admit or exit slips to measure understanding that was quick and personally informative. Teachers also felt that students and their parents were overemphasizing test scores that failed to take into account the complexity of learning and in effect undervalued learning.

Common meeting times for teachers teaching the same subject and grade level were rarely integrated into the timetables of middle and senior years schools. Although teachers requested scheduled, in-common preparation times, without them teachers met informally in the hallway or visited when one or the other teacher had a preparation class. Otherwise, with classes scheduled differently and extra-curricular responsibilities being

met before or after school and at noon hour, collaborative conversations were informal and brief.

School and divisional level support for professional development. Interviewed teachers pursued their own personal professional needs on an on-going basis. These teachers used the Internet to keep up-to-date in their discipline area as well as networking with others to learn about instructional practices other teachers were using. A number of teachers also sought the support of their English Language Arts Department regarding literacy strategies that could be integrated into their discipline area. Teachers suggested that professional development could include opportunities to plan cross-curricular integration of subject areas. It was also suggested that any school or divisional initiative needed to be revisited to support teacher implementation.

Curricula, timetabling, class size and composition. Teachers stated that they did not feel pressured by curricular demands at the school or divisional level. Timetabling was problematic in several ways: common preparation times were rarely scheduled for same grade and subject teachers; mandatory subject requirements for high school certification often resulted in mixed ability classes with teachers finding it a challenge to meet the needs of all learners, and the provision of special programs at the high school level sometimes resulted in small classes of highly academic students, leaving other same grade students to be placed in larger classes with a range of abilities.

Teacher knowledge about adolescent students. Teachers were aware that between 30 – 50% of their students had part-time jobs by the time they entered grade eleven and that this provided their students with purchasing power which seemed to be peer-driven to some extent. Students at this age were dealing with heavy workloads, sometimes in

terms of academic course requirements and sometimes in response to holding down jobs, extracurricular activities, and occasionally home responsibilities.

Teachers were concerned about students who dropped out of school early. They were uncertain about the causes for dropping out but a number of teachers felt it might be related to home issues. There was little support for students who were struggling in their learning outside of the classroom teacher. Parents, once notified of their child's school difficulties were often concerned and became involved by regular contact with the teacher, setting up a study schedule, and checking daily assignments. Other parents felt that it was their child's responsibility to pass the grade. Students whose absences had exceeded the allowable days were allowed by some teachers to continue to come to class if only for the emotional and social support.

Implications for Instruction

Teachers interviewed in this study were secure in their content area knowledge that permitted them to focus on student needs and responses and on ways to adapt instructional practices to meet the diverse needs of learners. Teachers who were life-long learners pursued personal professional areas of study and inquiry in search of becoming more knowledgeable. Thus the following seem essential for success in content area instruction: (1) a strong content knowledge base; and (2) professional development support at the school division level to accommodate personal inquiries and division-wide initiatives.

Draper and Siebert (2002) have been encouraged by current definitions of literacy and text that extend beyond traditional print material or web-based media to consider text "that takes account of all the things people create to convey or negotiate meaning" (p.3).

In this sense, literacy, in its broadest definition, is a concern to teachers in every content area “because creating, communicating, and negotiating meaning is an essential part of authentic activity in any discipline” (p.3).

Content Area Knowledge and Text-Processing

While interviewed teachers in this study were exemplary in their instructional goals to assist students in making personal and meaningful connections to the content, their focus was centred on the acquisition of content knowledge perpetuated by the way high schools are structured into discipline-related departments and constraints that arise when the school day is divided into separate discrete subjects (Moore, Bean, Birdyshaw & Rycik, 1999). The interviewed teachers in this study seemed to appreciate the advantages of combining science with language arts but seemed immobilized in terms of implementing such an initiative.

Moreover, most secondary teachers assert that their job is to teach content, not to teach students how to read, write, and communicate (Pressley, 2004). Yet, Pressley (2004) contends that more than 90% of parents, teachers, and the general public believe that strong literacy skills should be the priority of high school graduates, over the acquisition of content area knowledge, asserting that the long-term consequences of low ability in reading, writing, and communicating have more serious life implications than of not learning the content in secondary school. Some of the blame for isolating teaching content area subjects from text-processing (reading, writing and communicating) may rest with the literacy educators.

Draper and Siebert (2002), for example, state that literacy instruction in the content area needs to be reconsidered. An important first step for literacy educators in

resolving differences is to become familiar with the kinds of texts and kinds of teaching commonly used in content area classrooms and to begin discussion that resonates. The sample of interviewed teachers used varied sources for learning— newspaper articles, historical documents, government publications, the Internet, and video clips. The use of these, however, occurred with relatively little instruction in effective ways to aid processing the information. At the same time though, the interviewed teachers were able to remove themselves from the pull of their discipline and draw on a broader view of literacy (Stewart, O'Brien, & Saurino, 2003). Findings from this study might be a place to begin the dialogue about the interface between adolescent literacy and comprehension strategies in the content areas.

Instructional Approaches

While previous research revealed content area teachers possessed traditional academic values, both the questionnaire data and the teacher interviews seemed to suggest that teacher orientation toward instruction included social constructivist practices in which teaching and learning were supported by teacher scaffolding and collaborative group work. It seems advisable, therefore, to continue to focus on instruction that values high scaffolding and high collaboration in order to meet the needs of a diverse student population.

In this regard, Straw's model (2002) could serve as a framework at both the preservice and inservice level to help conceptualize instructional approaches and guide discussion about their historical development as well as their attendant advantages and disadvantages.

Adolescent Culture

Descriptions of the out-of-school lives of adolescents' are unlike those of the past. Students were struggling with balancing heavy academic workloads while attempting to maintain high grades, participating in extra-curricular activities, working at part-time jobs, and managing home responsibilities. Large numbers of students were employed in the workforce beginning in grade ten. The implications of being a viable consumer and accountable to an employer may place students in jeopardy. In fact, outside responsibilities may be a factor related to making the decision regarding whether or not to complete an assignment that does not contribute to a final grade. Employers seemed to be providing contradictory messages to students placing the value of a job over the value of education. Even in-school activities, such as extended field trips, created stress, putting students behind in their work in other subject areas.

Adolescents are highly concerned about how they are perceived by their peers and many make decisions based on avoiding ridicule and being labeled as "nerds" (Alvermann, Young, Green, & Wisenbaker, 2004; Gee, 2001). It may be that having a part-time job is more highly valued among certain peers than full attention to academic studies. This may result in a peer culture that plays down literacy rather than valuing strong literacy skills, in effect valuing mediocrity. But as cited in the work of Alvermann and her colleagues (2004), and according to Finders (1997) and Wells (1996), teachers can bridge the gaps between the culture of adolescence, the culture of the school, and the culture of the community.

Teacher interviews indicated a diversity of students in classrooms from students who were living on their own, to teenage mothers, to international students with cultural

and ethnic differences, from students choosing a vocational school to students entering a university program. Such diversity may be a trend emanating in part from the enrollment programs instituted by school divisions. While teachers were aware of diverse student backgrounds, interview discussion did not centre on cultural influences and competing “Discourses” (Gee, 2001) and their impact on the literacy learning complexities that are “often unrecognized even by those who spend much of their own time working or living with teenagers” (Bean & Harper, 2004).

Student Supports

Interviews with teachers revealed a number of issues existing within their schools that may need to be explored further with a wider range of schools. It seemed that grade nine (senior 1) was a critical year for student drop-outs. While teachers expressed concern about students leaving school at only thirteen or fourteen years of age, they lacked specific knowledge of why students dropped out. The general consensus was that there were family issues involved. Further, while teachers identified students who were struggling in reading and writing and responded with modified instruction as well as modified assignments, generally there was a dearth of school support for students who were functioning below grade level in literacy. Teacher support for these students focused on content knowledge acquisition, rather than on building literacy skills. Sweet and Snow’s (2002) conceptualization of the reader may help teachers provide more effective instruction in becoming competent, independent readers.

Implications for Teacher Preparation Programs and Policy Makers

Current entrance prerequisites for faculties of education, that require a first degree in certain teachable subject areas as well as two years of study in education, is supported

by findings in this study. Teacher preparation programs also need to continue to prepare candidates with the instructional tools to create programs that meet the needs of diverse learners.

Based on teacher accounts in this study, a class size of approximately twenty students may be the optimal level for providing scaffolding and collaboration. If current practices continue, interspersing low-income housing developments throughout the city, legislating for inclusion, recruiting students from abroad, and including special programs to provide education for all youth, then teachers need to refine their practices regarding differentiated instruction as well as instruction in reading comprehension and text-processing. Smaller class sizes could help teachers facilitate the range of needs within each class.

While teachers in this study were using a variety of ways to make meaningful and authentic connections between content and student background knowledge, it appears that students and their parents persist in using test scores and grades as determiners of student success. While this state of affairs may be driven by entrance requirements for post-secondary institutions, it fails to acknowledge the complexities of learning. The concept of "fair and equitable" assessment that some school divisions are implementing may be driven more by a response for community accountability than by educational research and theory. The movement may not only prohibit professional autonomy and inhibit instruction based on response to student needs, but also place the assessment emphasis on paper and pencil testing. For the interviewed teachers in this study, the focus on grades over the value of learning was uncomfortable. Although this issue of grades is

a timely one, with accountability testing in the United States at an all time high, divisions here need to consider teachers' perspectives and concerns.

Teachers pursued self-identified areas of professional development. While some school divisions provided a modest part of their allotted professional development days to allow teachers to pursue personal interests, many did not. School divisions could better support teacher development by providing time to pursue personal inquiries. On the other hand, teachers acknowledged the value of division-wide professional development initiatives, but appealed for ongoing support and feedback to assist them with long-term implementation rather than "random acts of inservice" that have proven to be ineffectual (Stewart, O'Brien, & Saurino, 2003).

Study Limitations

Findings from this study may have been influenced by the questionnaire itself. The wording of items and their categorization in terms of being representative of a particular instructional approach or as typical before, during, or after cognitive text-processing strategies may have been misleading. The language classifying the predominant instructional approaches as well as the descriptive items themselves may account for the statistical finding that approximately one quarter of the teachers in the sample used neither a predominantly scaffolded, nor a predominantly collaborative, nor a predominantly transmission approach to instruction. Demographic items did not separate out clearly the nature of academic degrees or distinguish between undergraduate fields of study and teacher education. There appeared to be an anomaly regarding the reported year of graduation and responses that indicated the majority of credentials had been obtained within the last ten years, yet most teachers were veterans. One possible

explanation is that teachers may have entered the field before completing their Bachelor's degree and have upgraded their credentials while teaching in the field, although there was no substantive evidence to support this notion. Another explanation may be that teachers simply indicated their year of graduation incorrectly.

The participants in this study were volunteers, and by definition a select group. The interview format invited self-reports not verified by observation. The fact that participants volunteered, suggested that they were secure in their teaching. Only sixty-five teachers from the thirteen schools that responded to the ethics call for participants, from an overall possible sample of approximately one hundred and sixty-three, participated in this study. The questionnaire return rate was 40%, leaving the perspectives of 60% of the pool of teachers untapped. Findings cannot therefore be generalized across a larger population. There were also discrepancies in the number of middle and senior years participants with more senior than middle years teachers taking part.

Implications for Further Research

This research has overcome the criticism of decontextualization that accompanied earlier research on instructional approaches and cognitive text-processing strategies in that the study both surveyed and interviewed classroom teachers. Although, as indicated by the self-reports, findings suggested that teachers used a variety of instructional approaches as defined in the literature, interactive practices prevailed, governed by the need to create a learning climate as well as structure and guide the direction of teaching and learning. Further research to confirm the findings in this study could focus on: establishing the construct validity of the questionnaire; repeating the study with a larger sample with more equal numbers of middle and senior years teachers as participants; and

conducting follow-up research with both classroom observation to obtain in-depth descriptors of the classroom context, and student interviews to better understand the situated context or complexities of the teaching-learning environment. Research needs to focus on the social context of adolescence in more depth so that instructional programs can better meet the needs of adolescence.

An interesting line of follow-up research might pursue the role of multiple texts, the use of downloaded information, and the attendant discussion that becomes, in turn, a text in itself.

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APPENDIX A

Middle and Senior Years Content Area Teacher Questionnaire

Dear Middle and Senior Years Content Area Teachers,

As you know our understanding of the teaching and learning process continues to grow, and, at our professional discretion we now have available to us a number of teaching and learning strategies to help support a range of diverse learners. Recently though, it has come to the attention of researchers that traditional experimental studies have not considered factors such as classroom contexts or school environments in which teachers and their students interact that influence teaching and learning. The purpose of this study is to identify the strategies that teachers across subject areas use and consider to be the most supportive of student learning needs. The survey is also an opportunity to create a better understanding of teaching and learning within the context of the classrooms of today.

This questionnaire represents the first phase of this study. Your participation in this questionnaire is completely voluntary. Further, you may choose to not answer all of the questions. Should you decide to participate in this questionnaire you will be contributing to the identification of instructional strategies that are used most often in specific content areas. The second phase of this study involves teacher interviews to gather reflections on the challenges teachers face in the classrooms of today.

There are three parts to the questionnaire. The first part is to gather some general information about yourselves, as content area teachers, and the teaching environment in which you teach. The second part is to identify the teaching strategies that you use most often in your classes. The third part asks you to identify the strategies that you use most often during textbook reading. This questionnaire was developed to be considerate of your time, requiring checkmark responses, and a brief listing of preferred instructional strategies indicated by item number.

Middle and Senior Years Content Area Teacher Questionnaire

PART A

Please read carefully and check off the boxes that apply to you.

1. Highest degree obtained.

- ☐ Teaching certificate
- ☐ Bachelor of Education or Bachelor of _____
- ☐ Masters of Education or Masters of _____
- ☐ PhD in Education or PhD in _____

2. Year degree was awarded

3. Total number of years of teaching experience.

- ☐ 0 - 3 years
- ☐ 4 - 7 years
- ☐ 8 - 13 years
- ☐ 14 + years

4. Gender: ☐ Female ☐ Male

5. Is your age:

- ☐ under 30
- ☐ between 31 and 39
- ☐ between 40 and 49
- ☐ between 50 and 59
- ☐ 60+

If you are a Middle Years Teacher, go to 6-a and omit 6-b. If you are a Senior Years Teacher skip 6-a and go to 6-b.

6-a. Subject area(s) CURRENTLY teaching. Check more than one if applicable.

Middle Years – Grades 5-8

Social Studies

- ☐ Geography
- ☐ History
- ☐ Science
- ☐ Both Science and Social Studies
- ☐ Other _____

6-b. Subject area(s) CURRENTLY teaching. Check more than one if applicable.

Senior Years - Grades S1 – S4

Science

☐ Biology

☐ Physics

☐ Chemistry

Social Studies

☐ History

☐ Geography

☐ World Issues

☐ Both Science and Social Studies

☐ Other _____

7. Total number of years teaching this subject.

(subject area)	(subject area)	(subject area)
<input type="checkbox"/> 0 – 3 years	<input type="checkbox"/> 0 – 3 years	<input type="checkbox"/> 0 – 3 years
<input type="checkbox"/> 4 – 7 years	<input type="checkbox"/> 4 – 7 years	<input type="checkbox"/> 4 – 7 years
<input type="checkbox"/> 8 – 13 years	<input type="checkbox"/> 8 – 13 years	<input type="checkbox"/> 8 – 13 years
<input type="checkbox"/> 14 + years	<input type="checkbox"/> 14 + years	<input type="checkbox"/> 14 + years

8. Location of the school: ☐ Inner city core ☐ More suburban (surrounding inner city core)

9. Total number of students in school

- ☐ Under 100
- ☐ 101 – 200
- ☐ 201 – 300
- ☐ 301 – 400
- ☐ 401 – 500
- ☐ Over 500

10. Number of teachers in my subject area other than myself.

(subject area)	(subject area)	(subject area)
<input type="checkbox"/> 0 - 1	<input type="checkbox"/> 0 - 1	<input type="checkbox"/> 0 - 1
<input type="checkbox"/> 2 - 3	<input type="checkbox"/> 2 - 3	<input type="checkbox"/> 2 - 3
<input type="checkbox"/> 4 - 5	<input type="checkbox"/> 4 - 5	<input type="checkbox"/> 4 - 5
<input type="checkbox"/> 6 - 7	<input type="checkbox"/> 6 - 7	<input type="checkbox"/> 6 - 7
<input type="checkbox"/> 8 or more	<input type="checkbox"/> 8 or more	<input type="checkbox"/> 8 or more

PART B

TEACHING CONCERNS AND INSTRUCTIONAL APPROACHES I USE TO PROMOTE STUDENT LEARNING

Circle the number on the rating scale beside each statement that best describes your teaching concerns and instructional approach according to the following:

1	Never
2	Seldom
3	Sometimes
4	Often
5	Very Often

There are no right or wrong answers. Responses will be pooled together, and common themes arising from the responses will be the focus of study. For the final part, please indicate the five instructional strategies you use most often.

Code to analyze predominant teaching approach. (NOTE: This did not appear on the teacher copy of the questionnaire.)

Scaffolded = S Collaborative = C Transmission = T
Located to the left of each item.

In your teaching to what extent do you:

- T** 1. Present information in a lecture format, using an overhead or power point presentation.
1 2 3 4 5
- C** 2. Have students work in groups to talk and share their ideas.
1 2 3 4 5
- C** 3. Use projects or activities that relate to real world application (posters, brochures, oral presentations, newspaper articles).
1 2 3 4 5
- T** 4. Have students work independently on end-of-chapter or worksheet questions.
1 2 3 4 5
- S** 5. Use graphic organizers (maps or charts to represent key concepts and supporting ideas).
1 2 3 4 5
- T** 6. Have students copy notes from the board or overhead.
1 2 3 4 5
- C** 7. Have students explain or demonstrate their understanding to the rest of the class.
1 2 3 4 5
- T** 8. Test at the end of each unit or textbook chapter.
1 2 3 4 5
- S** 9. Prompt students orally during discussion to clarify their understanding.
1 2 3 4 5

- C** 10. Have students work together collaboratively in small groups.
1 2 3 4 5
- S** 11. Move around the room to provide assistance as students work .
1 2 3 4 5
- S** 12. Teach tips for learning or remembering (metacognitive strategies) to help students read and study.
1 2 3 4 5
- T** 13. Use the textbook as the major focus of study.
1 2 3 4 5
- S** 14. Acknowledge difficulties or inconsistencies in text.
1 2 3 4 5
- C** 15. Find out what students already know about a new topic or unit before you begin.
1 2 3 4 5
- T** 16. Have students work independently when reading and writing.
1 2 3 4 5
- S** 17. Use a variety of print material (trade books, newspaper articles, pamphlets, etc.)
1 2 3 4 5
- C** 18. Have students consider divergent points of view.
1 2 3 4 5
- S** 19. Group students based on ability levels.
1 2 3 4 5
- C** 20. Have students discuss their knowledge, ideas, or questions.
1 2 3 4 5
- S** 21. Have students decide on their own topics for research and inquiry.
1 2 3 4 5
- C** 22. Work directly with small groups of students.
1 2 3 4 5
- T** 23. Worry about covering curriculum content
1 2 3 4 5
- S** 24. Provide students with a rubric or scale that will be used to grade their work.
1 2 3 4 5
- C** 25. Work with other teachers in the school to develop lesson plans or units of study.
1 2 3 4 5
- T** 26. Prefer that students work quietly.
1 2 3 4 5
- T** 27. Arrange students' desks to reduce student talk.
1 2 3 4 5
- S** 28. Give students an overview of the content that they will study.
1 2 3 4 5
- C** 29. Instruct students in strategies to process text.
1 2 3 4 5
- C** 30. Assume complete responsibility for curricular planning.
1 2 3 4 5

Now review the 30 instructional strategies and teaching concerns. On the lines below, list the numbers of the five statements that indicate the instructional approaches you use most often and the concerns you have about teaching. The five strategies or concerns I use/have most often are:

a. _____ b. _____ c. _____ d. _____ e. _____

PART C

Circle the number on the rating scale beside each statement that best describes your use of instructional strategies when using textbooks according to the following:

1	Never
2	Seldom
3	Sometimes
4	Often
5	Very Often
6	Not familiar with

Once again, there are no right or wrong answers. Responses will be pooled together, and common themes arising from the responses will be the focus of study. Note: The inclusion of #6 – Not familiar with.

Prereading

1. Preteach vocabulary.
1 2 3 4 5 6
2. Build background.
1 2 3 4 5 6
3. Use analogies to move from the familiar to the unfamiliar.
1 2 3 4 5 6
4. Use advance organizers.
1 2 3 4 5 6
5. Use questions to focus reading.
1 2 3 4 5 6
6. Use predicting.
1 2 3 4 5 6
7. Use think alouds.
1 2 3 4 5 6
8. Identify the purpose for reading.
1 2 3 4 5 6
9. Preview text headings, subheadings, illustrations, charts, graphs, etc.
1 2 3 4 5 6
10. Use anticipation guides.
1 2 3 4 5 6
11. Have students themselves identify unfamiliar words
1 2 3 4 5 6

During reading

12. Encourage use of visual imagery.
1 2 3 4 5 6
13. Use questions to guide reading.
1 2 3 4 5 6
14. Teach the use of self-generated questions.
1 2 3 4 5 6
5. Teach self-monitoring strategies.
1 2 3 4 5 6

16. Construct semantic or mind maps.	1	2	3	4	5	6
17. Use semantic feature analysis.	1	2	3	4	5	6
18. Use KWL (Know-Want to Know-Learned).	1	2	3	4	5	6
19. Use DRTA (Directed Reading Thinking Activity).	1	2	3	4	5	6
20. Use Guided Reading.	1	2	3	4	5	6
21. Use Reciprocal Teaching.	1	2	3	4	5	6
22. Use Questioning the Author.	1	2	3	4	5	6
23. Use study guides.	1	2	3	4	5	6
24. Teach text structure.	1	2	3	4	5	6
25. Teach summarizing.	1	2	3	4	5	6
26. Teach sentence combining or sentence reduction.	1	2	3	4	5	6
27. Teach strategies for clarifying ideas.	1	2	3	4	5	6
28. Teach outlining.	1	2	3	4	5	6
29. Teach notetaking.	1	2	3	4	5	6

After Reading

28. Have students write about their understanding.	1	2	3	4	5	6
31. Provide feedback to student responses.	1	2	3	4	5	6
32. Use peer response groups.	1	2	3	4	5	6
33. Use inquiry groups.	1	2	3	4	5	6
34. Use writing for recall, extension, or application.	1	2	3	4	5	6
35. Use compare-contrast frameworks.	1	2	3	4	5	6
36. Use the jigsaw strategy.	1	2	3	4	5	6
37. Use the fishbowl technique.	1	2	3	4	5	6

Appendix B

Interview Questions

Following are a list of open-ended questions that will be asked to seek participant views of their experiences, or in other words, to tell a story about their teaching in their own words. Questions are open-ended so that participants can speak to their own, personal experiences. Prompts are listed below each question to assist the interviewer in probing further.

A. Your responses to the questionnaire that you filled in earlier indicate that you are using a number of teaching strategies that meet with current thinking in the field of adolescent literacy. (Interviewer names some of the instructional strategies that the interviewee indicated they used on the questionnaire and asks a number of probing questions.)

Prompts:

Describe the students you teach (university bound, vocational training, business training, job training while in high school, ethnic make-up, diversity).

Which teaching strategies do you find work best? Why?

Which do the students seem to like the most? Why?

B. Please describe the challenges you have faced and/or are now facing in implementing the strategies you identified in the questionnaire. For instance, (Identify an instructional practice the teacher indicated using.)

Prompts:

Can you tell me more?

Can you be more precise?

Can you give me an example?

C. Do you meet with other teachers to discuss teaching?

If participant answers "yes", prompt with:

How do you find the time to meet?

How often do you meet?

Do you meet during common preparation times?

Do you plan units together? How do you go about doing this?

Does the administration set special times for your group to meet and plan together?

D. What about professional development?

Prompts:

How do you keep your teaching current?

Does the school division provide leadership?

Have you attended any workshops this year? Who do you find most supportive in terms of professional development?

Does your language arts consultant or reading clinician have a role to play?

Does someone from Education and Training help you understand the demands of the new curricula? In Language Arts? In your field?

E. How do you describe the workplace environment in which you teach? How do you feel you are supported?

How do you deal with this in terms of:

The new curriculum?

Use of a prescribed textbook?

Role of administrator in your instructional decision-making?

Demands of the school division in terms of division-wide testing, timetabling, class size, and class composition?

Additional responses will be sought to queries that evolve from participants' responses to the questionnaire...