

A MULTIPLE INTELLIGENCE VIEW OF LEARNING AT THE HIGH SCHOOL LEVEL

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ABSTRACT

This study drew upon a constructivist and Howard Gardner's multiple intelligence view of learning, to develop an interactive curriculum development model involving high school students and teachers. Eight grade ten students contributed in a central way to the study, a factor precipitated by my intention to emphasize students' perspectives concerning their individual abilities and interests, and the way in which the high school curriculum did or did not accommodate these. Four grade ten teachers also participated in the task of identifying the degree to which students' individual differences can be accommodated in an integrated high school curriculum.

The study, conducted over a ten-month period during one school-year, addressed three questions. 1). What is the nature of the curriculum development process when high school students and teachers in their classroom practices, apply ideas congruent with Multiple Intelligence Theory, in order to address individual student differences, within the traditional constraints of a high school? How can these processes be incorporated into a model? 2). What was the role of the students in the development of the Multiple Intelligence Theory Application Model? and, 3). What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model? My response to these questions involved the monitoring of students' perspectives concerning their interests and abilities as reflected by both their current curriculum and the integrated curricular unit prepared by the teachers. The students' and teachers' perspectives are discussed and examined by means of in-depth interviews, interactive group discussions, and field notes and documentation of the collaborative processes involved in developing the integrated curriculum unit.

The analysis of the findings suggests that change within the curriculum content, consistent with a constructivist and MI view of learning, would enable students to develop further their individual differences. Such change is endorsed particularly by the high school student participants. The study also examines the usefulness of the MITA Model as a means of initiating that change, within an integrated studies context. Finally, I suggest a number of related issues for further research.

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CHAPTER 1: INTRODUCTION

What are students' perceptions of their individual abilities and interests, as these are developed in high school? More central to this study is the question: have students been asked about their perceptions? This thesis emphasizes students' responses to the issue of whether their individual differences are being addressed in their high school curriculum, and to a lesser degree, teachers' perceptions of student differences. The study also examines two distinct but related views of learning, in terms of the capacity of each view to accommodate individual differences among students. The first view, constructivism, holds that people learn by actively constructing knowledge in relation to their prior knowledge and experiences. The second view, Gardner's (1984) Multiple Intelligence (MI) view of learning, holds that learners possess at least seven autonomous intelligences. Both learning theories are examined in terms of their usefulness to address student individual differences. The study is organized in seven chapters.

Chapter 1, the introduction, outlines the need, aims, and scope of the study. In this chapter the eight students and their urban high school setting are briefly described. Here, the interconnectedness is illustrated, between the students' expressed passions (which include interests and abilities), their high school curriculum and Howard Gardner's seven ways of knowing.

Conversations with eight grade ten students, about their individual differences and their high school curriculum, provided the frame for the study in several ways. Following my initial interviews with these students, came a determination to provide a forum whereby students could express further their views about their own learning. Students, in fact, through their individual stories about their interests and abilities, contributed to

the refinement of my research focus. As students shared their perceptions of their individual differences, and provided illustrations of their high school curriculum, they identified several curriculum issues that the study subsequently addressed. For example, students expressed the significant contribution that peers bring to their learning, and they reinforced the notion of collaborative group work in the classroom. Similarly, students recommended other curriculum changes, such as more parental involvement in the development of curriculum content. Not surprisingly, students confirmed several recommendations that are currently found in the research literature on high school change. For these reasons, the students are introduced in the first section of the study rather, than the more typical introduction of participants in the research analysis section, in Chapter 5.

Chapter 2, the review of the literature, is divided in three contexts: the curriculum integration context; the theoretical context; and, the practical context. The first, or curriculum integration context, provides a rationale for curricular integration based on Jacob's (1989) model. The second, or theoretical context, discusses constructivism and MI Theory as research paradigms that accommodate the development of student individual differences. The third, or practical context, illustrates the current plan for curriculum changes proposed by the British Columbia Ministry of Education. The ministry documents for high school change, the *Year 2000* Graduation Documents, are examined as illustrations of an integrated curriculum approach within a constructivist, and an MI Theory related context.

Chapter 3, the methodology section, examines the data collection and analysis procedures. First, the context of the study is presented, as a foundation from which to discuss the rationale for the particular organizing scheme used, and to respond to issues

of validity and reliability. The qualitative methods of participant observation and in-depth interviewing are discussed in this chapter.

Chapter 4 describes the background and implementation of the MI Theory Application (MITA) Model. The MITA model was developed in cooperation with both student and teacher participants. The model, developed from my interpretations of our lengthy discussions, was then reported back to the four grade ten teachers at the high school, in order to provide a common strategy for implementing change that would address student individual differences. All eight student participants were enrolled in grade ten, at the time of the study. The four teacher participants represented four high school disciplines: English, mathematics, science, and social studies.

Chapters 5 and 6 report the findings and provide an analysis of the data obtained from the students and the teachers, respectively. In these two chapters the strengths and weakness of the research are discussed in relation to both the questions raised and the outcomes achieved. The views of students and teachers concerning student individual differences, the existing curriculum, and their recommended changes to the curriculum, are highlighted.

Finally, Chapter 7 presents a brief overview of the study and outlines the conclusions derived. Implications for further research relate the conclusions to the previous literature discussed in the thesis. This final chapter discusses ways in which each research question was addressed in the study, and outlines the contributions made by the research.

1.1 Background to the Study

According to Zessoules, Rieneke, and Gardner (1991), traditional, Western high school curriculum has neither recognized the many nuances of individual students' unique abilities, nor has it woven the multicultural fibers necessary to include the unique experiences of an increasingly ethnic, racially diverse, structurally changing society. Societal changes, in addition to our new understandings about the ways in which we learn, may require significant reorganization of high school curriculum structures. By curriculum structures, I am referring to the way in which time, space, authority, subject matter and people, are organized in a high school. Is most time spent on lectures, for example, or is equal time allotted to student-directed activities? Are desks in rows or do students move around, according to the nature of the task? Who controls the learning that takes place? What knowledge base contributes to the subject matter? Finally, what can students' contribute to our understanding about high school curriculum structures that address their unique abilities? In short, this study sought to determine what contributions these young partners might make in the deliberations about the delivery of curriculum.

If high schools are to keep pace with a changing society, and respond to the current social pressures exerted on schools, high school curriculum, for example, will have to change. Conventional high school curriculum do not appear to be able to accommodate an information age, where the ability to cooperate with others sometimes surpasses the ability to memorize isolated facts. A fixed timetable of classical studies, for example, may be meaningless in a multicultural society where more than one canon is acceptable. According to Hargreaves (1988), Sternberg (1991), and Cuban (1990), five such societal forces - economic, social, demographic, organizational, and educational have

moved us away from rigid, and fragmented disciplinary structures in high school. Dickinson (1991) suggests high schools have moved towards the development of more thematic units where teachers collaborate in the production of curricular materials, and encourage individually designed projects from each student (p. 210).

This study explores how a constructivist perspective of learning and MI Theory might facilitate the accommodation of students' individual differences. Student differences refer to their expressed abilities and interests. The term "passion" was used throughout the study and in my conversations with students to include: "perceived ability", "a skill you excel in", or "a high interest of yours", and throughout the study these four expressions are used interchangeably with the notion of "intelligence" as articulated by MI Theory (Gardner, 1983). In contrast to Rowe's (1991) claim that present high school curriculum has led to "a narrow and dogmatic view where educationalists and industry evaluate performance potential and practice on the basis of what they regard as scientific and objective knowledge" (p. 4), Gardner, in *Frames of Mind* (1983), argues that all human beings are capable of at least seven different ways of knowing the world. Gardner's *Multiple Intelligence (MI) Theory* suggests that we are able to know the world through linguistic representation, logical-mathematical analysis, spatial representation, musical thinking, the use of the body to solve problems or make things, an understanding of other individuals, and an understanding of ourselves. Gardner (1991) argues that each person is born with a unique combination of strengths and weakness in these seven areas, but that all of them can be more fully developed through education.

How then can high school teachers make sense of Multiple Intelligence ideas in their classroom planning, given the traditional constraints of a high school? Four basic

changes are necessary: (1) MI Theory proposes that people use at least seven relatively autonomous intellectual capacities; a concept, if adopted, which would alter the way we view high school curriculum; (2) since students learn in many different ways, a high school curriculum would need to be flexible in order to accommodate these student interests and ability differences; (3) assessment would become broader and more performance-based, and less dependent on memorization and short paper-and-pencil tests; (4) instructional units would shift further from a teacher-centered and disconnected curriculum toward a more integrated or thematic approach, which builds on individual students' prior knowledge in each unit taught, and capitalizes on the various configurations of abilities represented in the participants.

The British Columbia Ministry of Education (1990) responded to the need for change, through the development of the *Year 2000 Documents. A Framework for Learning*, suggests that several aspects of human development, such as mind, soul, spirit and body, impact on student learning. For example, the intermediate program promotes development in six areas: (1) intellectual; (2) artistic and aesthetic; (3) emotional; (4) physical; (5) social; and, (6) social responsibility. In order to address these developments, the *Year 2000 Documents* propose some possibilities for curricular integration. This proposal is based upon student-centered instruction, and increased student responsibility for setting standards. *Year 2000* supports performance-based assessments at the high school level which would include portfolios and conferencing. As well, increased communications are encouraged with the wider community as part of the notion of life-long learning.

While the notion of educating individual differences is recognized by many (Sternberg, 1991; Perkins, 1989; Gardner, 1991; Shekerjian, 1990; Walters, 1986),

recent studies have suggested that this ideal is more difficult to achieve in the upper grades (Gardner, 1991). Philosophically, this study supports Dickinson's (1991) notion that high school students should have opportunities both for creative exploration of their individual interests and abilities, as well as opportunities for learning valued skills and concepts through multimodal means. According to Brown (1991) there is a *myth* often expressed that a return to mastering the 3 R's would improve the quality of high school education. Simply stated, this study seeks to temper concerns with mastery of the 3 R's, which Brown argues, traditionally characterizes high schools, with concern for how well students adapt their knowledge within new socio-cultural contexts available to them. For example, how can knowledge be adapted to address the challenges presented by contemporary technology in a changing society. Since high school students' voices are virtually absent in the literature on high school change (Fullan, 1982), students' perspectives were emphasized as essential and central to the research. To ensure the students' voice remained paramount to the work, I included responses from conversations held with students concerning their individual abilities and the high school curriculum's capacity to address those differences, as a central part of this study. In this way, the study "brings to the table" high school students' perceptions concerning their unique abilities, their high school curriculum, and their perceived relationship between the two.

1.2 The Need for the Study

While a primary purpose of the study is to extend our present knowledge of how student individual differences are addressed in the high school setting, a secondary purpose is to explore the application of constructivist and MI theory as useful curricular tools to address these differences, given the constraints of traditional high school

curriculum. In part the study emerged from my own desire to involve students in a conversation concerning the creation of an active learning community, responsive to the initiatives outlined in the *Year 2000* documents. The community envisioned here, provides teens with opportunities to develop their unique abilities. In part, the study provides a response to the increasing demands on high schools to equip teens with the skills that provide what Dickinson (1991) refers to as "a sense of destiny and purpose in order to face a changing world." In proposals such as British Columbia's *Year 2000* documents, we are encouraged to create a richer culture in school, richer through the recognition of the whole gamut of human abilities. To facilitate such a shift in high school practice, would be to weave a less arbitrary curricular fabric, one in which a diversity of human abilities is accepted.

How can we accommodate students' abilities unless we talk with them, and listen to their suggestions? This study, through listening and conversing with teens, suggests a framework for an extension to the present perimeters of conventional high school curriculum. That is, it argues for a shift toward a broader-based recognition of expressions of student achievement. An example of one such extension, would be the development of an educational community where teens are motivated to develop their individual passions, and to explore the relationship between mandated school curriculum and their real world environment. For too many teens, including those who are identified as gifted, school restricts such personal development, and they drop out mentally or physically. The number of students who leave school before graduation, is on the rise (Roach & Bell, 1990). Due to the continuing problem of teens dropping out of school, Canada's federal government recently committed \$296.4 million per year, in a five year initiative toward keeping teens in school. While this study is not concerned specifically with high school

dropouts, it does agree with Roach and Bell (1990) that students who are motivated and interested in school, and who find high school personally meaningful, will be less likely to leave. This study provides one possible response to the dropout problem, an extension of present knowledge about students' individual needs and abilities.

Since the participant teachers had expressed a desire to work for further change in addressing individual differences, and because we agreed that MI Theory might provide a useful tool to address those differences, it appeared timely and appropriate to work together to introduce the application of MI Learning Theory as a useful response to this problem.

1.3 The Aim of the Study as Defined by Student Concerns

On one level, the study describes the responses of four teachers to the application of the Multiple Intelligence (MI) Theory model to planning and teaching several integrated curriculum units to students in grades eight, nine and ten, and illustrates both the obstacles encountered, and the successes resulting from the effort. As defined by student concerns, this study is a collection of eight grade 10 students' stories about their individual abilities, how their passions are addressed within their high school curriculum, and how their individual differences relate to MI Theory.

1.3.1 The Setting

The participant school enrolls 200 gifted students in grades 8 through 12 in an alternative school setting within a larger public high school. The school's definition of "gifted" is examined further in chapter 3 under the title, "Context of the Study".

The participating students attend some elective classes in the main school. The gifted school area, on the third and top floor of the larger public school, consists of five regular classrooms and a small workroom with 10 computers that the students are free to use. One room designated the "all purpose room" is reserved for small group work or project endeavors.

The enriched program at the research site, is characterized in several ways. First, the school is committed to "provide students with gifted potential an exciting and challenging educational environment" (School's Statement of Intent), which includes "access to up-to-date educational technology". Second, students are admitted to an enriched program (in all classes) in grades 8, 9, and 10. In grade 11, the students take enriched elective classes as well as enriched English and Social Studies, and take all other classes at the main school. In grade 12, only English is enriched. Third, the four main teachers (of enriched mathematics, social studies, English, and science) have met regularly for the past seven years, in order to integrate their curriculum around common themes.

The eight student participants were selected by the head teacher, in response to my request. As I requested, they represented a variety of abilities, as well as (Canadian, Japanese, Chinese and Indonesian) cultures. The students and I first met as one large group, in the computer room during a regular social studies class. In order to get acquainted, we talked informally about school, their likes and dislikes, and what they wanted to accomplish through their education. Subsequently, I spoke for approximately one additional hour with each grade 10 student over a period of several weeks. Although I visited the school at least once a week for several months, I did not interview the students individually again until June. Following their completion of interdisciplinary

thematic projects, I met once with the students in a group, and then individually for a final interview. In the weeks between the initial interviews and the final discussions with students, I often spoke informally between classes, with both the participant students and their peers in the high school halls or classrooms.

1.3.2 Student Participants Describe their Passions

In order to identify what students perceived to be their highest interests and abilities, we sometimes interchanged the terms, "interests" and "abilities" with the term "passion". Students were very clear concerning their "passions" for knowledge, and how these were addressed at school. Figure 1.1 illustrates relationships that students made between their individual differences, and the accommodation for their passions, within the high school curriculum. The figure demonstrates a wide variation in students' perceived intelligences, and includes all seven intelligences which are contained in MI Theory.

Figure 1.1: Relationships Between Student Passions, High School Curriculum and MI Theory

Participant	Passion	Reference to MI Theory	Student Quote
Joe	sports	kinesthetic	"use in French questions"
	computers	spatial	"schools need more"
Elaine	math	logical-mathematical	"like more applications"
	photography	spatial	"need teacher's help"
	camping	intrapersonal	"enjoy being in nature"
	teaching others	interpersonal	"it's more fun"
Les	debate	linguistic	"I excel in"
	singing	musical	"used in English once"

Participant	Passion	Reference to MI Theory	Student Quote
Kara	swimming	kinesthetic	"a competitive swimmer"
	art	spatial	"drawing and stuff"
	history	linguistic	"especially Can. history"
	drama	kinesthetic	"wing it type of person"
	communicating	interpersonal	"speaking & teaching"
	science labs	intrapersonal	"not in the textbook"
Sam	sports	kinesthetic	"a wide range"
	creative ideas	linguistic	"original ideas"
	art	spatial	"pretty good at it"
	business	interpersonal	"marketing business"
Chelsie	math	logical-mathematical	"I'm pretty good"
	piano	musical	"popular & classical"
	sports	kinesthetic	"badminton & tennis"
	reading	linguistic	"I like reading"
	writing	linguistic	"essays and stuff"
Cathy	piano	music	"I like playing"
	socials	linguistic	"very interesting"
	English	linguistic	"I like doing"
	Working with people	interpersonal	"a social worker"
	music	musical	"I'd add music"
Keith	sports	kinesthetic	"I do really well"
	math	mathematical	"do exceedingly well"
	science	mathematical	"Chemistry was easy"
	socials	linguistic	"more oral presentations"
	art	spatial	"more projects"

Joe stated a high interest in basketball, football, hockey, baseball and computers, but told me he found grade 10 "tough". He regretted having only three hours of physical

education each week. When I asked how much time he spent relating his interests or abilities to curriculum content, Joe told me that only one such relationship ever occurred. On one occasion he used sports ideas to compose his sentences in French class. Unfortunately, while Joe tried to relate his kinesthetic interests and abilities to some aspect of high school learning, the curriculum did not appear to accommodate these abilities. According to Dickinson (1992), in order to prepare students like Joe for a technologically sophisticated future, we need to recognize a wider range of abilities in high school students. In Joe's case, would it not, for example, be useful to facilitate his kinesthetic strengths through the increased use of computers, or audio-visual materials? Could drama also be used in order to relate Joe's kinesthetic abilities to meaningful classroom activities?

From our conversations, Joe appears to learn most, and to enjoy learning most, through his body - especially through movement, and particularly through sports. It appeared to him as though the curriculum did not accommodate those learning proclivities, and so, while other students who expressed meaningful relationships between their passions and school's activities tended to enjoy school, Joe simply tolerated school. In Joe's words there is, "nothing much" he liked about his classes. Joe's insights beg the question: Is it possible that the curriculum could be expanded in order to accommodate a variety of abilities, in order to increase students' enjoyment and development of a variety of skills?

Elaine expressed a proclivity for math, photography, camping (she told how her class camped for 5 days away from the big city and spoke of how she enjoyed nature). Elaine also expressed enjoyment through teaching other students math and English. She resented having to wait for all the kids to understand each math skill since she said that

"you can learn math on your own and you don't need a teacher," but felt she had to "pay attention" to the explanations provided anyway. In photography she said it was alright to have to pay attention all the time, because the teacher had to teach all the new parts. But in math it was different - since she knew the material ahead of time. Others in the group told how Elaine taught them most of the concepts they struggled with - and they frequently confirmed her own perception of her expertise in math skills.

Les said his highest abilities included debate, singing, math, and he particularly liked to listen to different sounds in music. When asked about his opportunities to use his abilities to learn, Les told of his pleasure once in English class when the group acted out scenes from Romeo and Juliet and he sang for the play. Les stated, however, that he did not expect that he would have many opportunities to develop his unique abilities in high school.

Kara spoke of her competitive swimming classes which consumed 4 hours per day, as "training 6 to 8 times a week". While school did not allow her to use this ability, teachers were described as understanding when she left early for swimming or turned assignments in late during competitions. Kara also expressed enjoyment and ability in art, speaking, communicating and drama, and social studies. She especially like Canadian history, and attributed this enjoyment to what she referred to as her father's "mouse stories". From as far back as Kara could remember, her father told his "mouse" stories which tended to teach about trains, landscapes and early settlers. While not sure of why they were "mouse stories", these stories related to "real life" according to Kara, and "you learn more when school relates to life". Relating school to real life also made learning more interesting. Kara especially enjoyed a science project in which a lab not in the text but created by the teacher allowed her to collect wood lice from home and

observe their habits over time. Sometimes in P.E. she was allowed to teach others, another activity which enhanced learning and enjoyment for Kara. Unfortunately, there are far too few opportunities for such teaching, according to Kara.

Sam told me he liked basketball, volleyball, swimming, badminton, racquetball, tennis, creative ideas, arts, and marketing business. He told me he wished school would relate more to his interests in business. Sam expressed the desire to understand taxes and other material "related to real life after", so that he could prepare better for his future career.

Chelsie, who speaks both English and mandarin fluently, expressed high abilities in math, piano (both popular and classic), badminton, tennis, reading, music theory and writing essays. Chelsie told me that if the teachers could lengthen their classes so that the number of disciplines changed from 5 shorter periods to 3 longer sessions daily, she felt they would have more time to relate school to the real world, an important but missing factor in high school curriculum.

Cathy stated her highest abilities as: playing the piano, socials, working with people, English, drama, and music. Along with many others of the group, Cathy suggested that the reason there was "little time to follow your passions" was that the teacher had to "get through" a certain amount of prescribed curriculum.

Keith seemed to especially enjoy discussing his educational interests, and referred to several passions with enthusiasm. When asked about his highest abilities he told me he does really well in sports, running (only finds time to run twice a week) math, science, (especially Chemistry because it's so easy), computers, socials and art. He emphasized that he does exceedingly well in math. Keith's interests include doing projects and he

wishes there was more time to do these. He regretted there was little time for hands on activities and also wanted to see more oral presentations in high school.

1.3.3 The Researcher's Role As Shaped by Students' Stories

The students, through their stories about their own individual differences as well as their school's ability to address these differences raised five questions which helped shape my own role and the focus of this study: Following initial student responses concerning their own passions and their high school curriculum, I was challenged to consider: 1). How can we divide school time in order to include the students' passions for development of their individual abilities and interests?; 2). How can we cultivate an environment where friends are free to nurture and support one another; 3). How can we increase student autonomy in order to produce independent learners?; 4). How can schools be more connected to the students' passions and the real world of today?; 5). How can we encourage parental involvement in critical curriculum issues?

After my conversations with students, I gradually recognized that they would structure the research in a way that I had not anticipated. In other words, their understandings, their suggestions, their concerns became central to the study. My contribution to the study was to introduce teachers to the MI Theory approach, and to work with them toward implementing of the Multiple Intelligence Theory Application (MITA) Model in each of the four disciplines (mathematics, science, English, and social studies). While students were not asked direct questions about any particular discipline or teacher they spoke most favourably of their school environment and of their relationship with teachers. Because of the mutual respect apparent between students and teachers and because I too had come to care for and respect each student and teacher

through many hours of working together, I felt comfortable about allowing this study to represent a conversation of sorts between students and their teachers -- one that would hopefully have an effect on educational change reaching farther than one school. Certainly, however, my own role as researcher was a significant factor in how those conversations were formulated and in how they are represented. For according to Tesch (1991), all understanding is interpretation, and whenever a researcher encounters data, the new is integrated into the researcher's pre-understanding. In other words, research findings are really the researcher's story, as much as the participants. The reasoning here is that the researcher's pre-understanding is influenced by philosophical assumptions, theoretical views, experience, education, discipline and so on. My own pre-understandings of the research problem and related questions, are especially shaped by my particular concerns for giving high school students a voice in what content they learn, by my understanding of Gardner's MI Theory developed over many years, and by application of constructivist ideas as illustrated in doctoral seminars with Dr. Gaalen Erickson and Dr. Billie Housego during the research period.

1.4 The Research Problem and Questions

The primary research question guiding this work is:

1. What is the nature of the curriculum development process when high school students and teachers in their classroom practices, apply ideas congruent with Multiple Intelligence Theory, in order to address individual student differences, within the traditional constraints of a high school? How can these processes be incorporated into a model?

This question generates two further questions specific to the context of the study:

2. What was the role of the students in the development of the Multiple Intelligence Theory Application Model?
3. What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model?

1.5 **A Final Note**

A number of issues specific to the development of students' individual differences emerged from the analysis of students' and teachers' interviews over a one-year term. The analysis was guided in part by questions to the students and teachers concerning five main curriculum dimensions: *time; space; authority; subject matter; and, people*. The MITA Model served as a tool for implementing Multiple Intelligence ideas in the high school classroom. Chapter 2 reviews some of the research literature that provides the conceptual lens through which the data in this study are examined and discussed.

CHAPTER 2: INTEGRATION, LEARNING THEORIES AND CURRICULAR CHANGE

2.1 Introduction

Chapter 2 presents a review and synthesis of the research literature judged to be relevant to the research problem. Three major aims of the review are identified: to elaborate a view of learning based on the notion of an integrated perspective on curricular content, as outlined by Jacobs (1989); to describe the development of student individual differences; and, to explore the relationships among integrated curriculum, constructivism, and MI Theory as these are manifested in the British Columbia Ministry of Education *Year 2000 Documents*. Constructivism and Multiple Intelligence (MI) learning theories provide a lens through which to explore student differences. In order to explore the relationships between integrated curriculum, constructivism and MI Theory, it is useful to examine how each of these is expressed within a practical context of change. In terms of current change taking place in secondary schools, the study examines the Ministry of Education (1990) *Year 2000 Documents*. For an overview of how these three contexts are used to frame the study, see Figure 2.1. This figure provides an illustration of how the study relates the research literature to the problem of how to accommodate student differences in the development of curriculum.

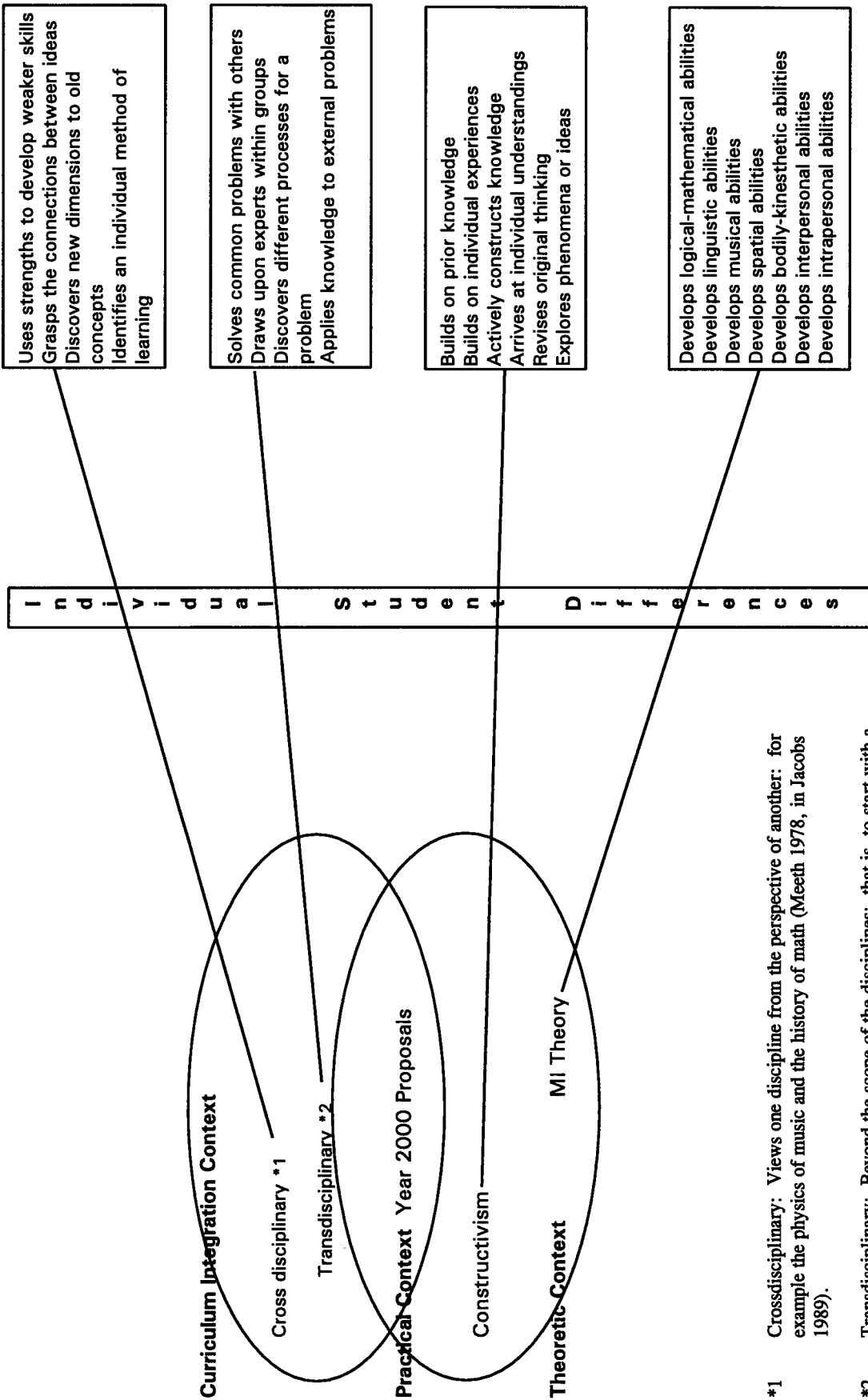
Three issues, then are central to the aims of the study: the identification of a rationale for curricular integration; the integration of constructivism and MI Theory; and finally, the examination of the *Year 2000 Documents* as a framework for change, which appears to be consistent with both constructivism and MI Theory.

The essential assumption of constructivism, that knowledge is constructed rather than received (Benson, 1989, & von Glasersfeld, 1989), together with the MI view that

Figure 2.1 Development of Student Individual Differences in High School

Facilitates development of student differences

Student differences developed in several ways:



*1 Crossdisciplinary: Views one discipline from the perspective of another: for example the physics of music and the history of math (Meeth 1978, in Jacobs 1989).

*2 Transdisciplinary: Beyond the scope of the disciplines: that is, to start with a problem and bring to bear knowledge from the disciplines (Meeth 1978, in Jacobs 1989).

knowledge can be manifested in at least seven autonomous intelligences (Gardner, 1984), together provide a conceptual frame for the study. Prior to the discussion on integration, a backdrop discussion on high school change and resistance to change, shows a curriculum shift in some high schools, from a more subject-based curriculum toward a more integrated approach.

2.1.1 Recommended Change for High School Education

Five societal forces -- economic, social, demographic, organizational, and educational -- help to establish the context and general directions for restructuring high school education (Hargreaves, 1988; Sternberg, 1991; and Cuban, 1990). This study concentrates on two of these forces, educational, and new demographic forces, as they are expressed in an increasing emphasis on multiculturalism. On the topic of education: according to Sternberg (1990), Western curriculum has neither recognized the many nuances of individual students' unique abilities, nor has it addressed the development of these abilities. Concerning the demographic force, there is a shift from curriculum that addresses one or two cultures to a multicultural emphasis. Current high school curriculum, however, has not woven the multicultural fibers necessary to include the unique experiences of its increasingly ethnic/racially diverse social structures (Dickinson, 1992). Were these difficulties remedied, it is conjectured that a greater number of students would use more of their intellectual abilities. Addressing the above educational issue may result in greater opportunities for the development of students' individual abilities. Addressing the change in demographic patterns may result in changes that accommodate an increasingly multicultural society. According to McCune (1991),

researchers generally agree that, such "change must occur if schools are to achieve their contract with society to prepare . . . youth for a future world." (p. 182)

One practical consideration emphasized in the literature concerning change, is the shift in Western high school curriculum from a mechanistic structure, which is rooted in the Greco-Roman liberal arts, to the individual student profile and interdisciplinary models emphasized over the past ten years (Schubert, 1986). A familiar pattern of "traditional" high school curriculum structures since the turn of the century includes: courses targeted to students whose futures after graduation vary; electives; subject-based instruction; diploma requirements; 20 to 30 students in a class; and, a teaching load of five to six classes daily. These "traditional organizations", are moving toward a more integrated model, according to Dickinson (1991). The structural shift is toward an integration of mind, body and spirit through integrating different subjects within a more thematic curriculum (Rowe, 1991; Fullan, 1989). The inadequacy of "traditional" high school curriculum to address individual student differences has been addressed previously (Bruner, 1985, Cuban, 1982; Dickinson; Eisner, 1985, & Fullan, 1990). Adequate alternative strategies, however, have yet to be implemented.

2.1.1.1 Obstacles to Change

Over the past century Western high schools have experienced remarkably few fundamental changes (Cuban, 1990). In spite of the considerable research concerning student-centered curriculum, and in spite of efforts made to help students move beyond rote learning (Stumbo, 1989) to what Gardner terms, "genuine understanding," several obstacles to change exist. Simply put, the need for change is obvious, but the willingness not so evident. McLaren (1989) describes the need:

Teachers face overcrowded classrooms, large immigrant populations, outmoded pedagogical theories, stifling bureaucratic demands, deskilling of teachers, insufficient funding and resources, and a hidden curriculum that favors certain groups over others on the basis of race, class and gender; and the list goes on and on (p. 180).

Cuban (1982), however, argues that high schools have been immune to change, not because they are effective, but because they are resilient and invulnerable to reform. According to Cuban, the American high school is:

. . . a resilient and remarkably invulnerable institution - [which] has been structured in much the same way since the turn of the century. . . . This durable structure, though largely unexamined, has been implicitly endorsed by each new generation of studies of the high school. (p. 113)

Presumably Canadian high schools are similar.

How then, given the limitations within the high school's present structure, can educators expand the curriculum to educate students in a changing world? One recurring difficulty in establishing the relationship between high school curriculum and student individual differences, has been the lack of research on high school students' perceptions of school. This exclusion of students' contributions to their curriculum is identified by Fullan (1982), who argues that teachers frequently do not talk to students about their perceptions of the curriculum. Fullan's assumption provides a justification for this study,

which seeks students' perceptions' of their own interests and abilities, and of their curriculum's accommodation of these.

The notion of how to accommodate for individual student differences (Gardner, 1991, Sternberg, 1991) continues to raise questions about the efficacy of the "traditional" high school's segmented disciplined curriculum structures. In fact, while the importance of teaching for individual student differences is recognized by many investigators (Sternberg, 1991; Perkins, 1989; Gardner, 1991; Shekerijian, 1990; Walters, 1986), recent studies have suggested that this process is more difficult to achieve at the secondary level (Gardner, 1991).

One reason that has been offered to explain why change in high schools often fails (Fullan, 1991), in spite of the expressed desire for change by researchers and educators, is that school organizations have established rules and patterns of behaviour more for efficiency than for learning. Practices like standardized testing, lecturing and grouping approximately 30 students together frequently mitigate against change (Cuban, 1982; Kliebard, 1986; Hargreaves & Earl, 1990; Britzman, 1989; Sarason, 1990, & Brown, 1991). Brown describes the problem of inherent resistance and argues that it is not enough to be limited to an attempted mastery of the three R's. Emphasizing creative thinking, Brown recommends that we create a learning environment where students develop the ability to think critically and creatively, to solve problems, to exercise judgement and to learn new skills. Creation of this type of interactive learning environment, according to Brown, would require researchers to foster more conversations with teachers and students. How would researchers enter into this process of communication? Is it possible that teacher education could lead the way in fostering increased communications among students, teachers, and researchers? Perhaps theory

could be applied to practice through the development of curricular materials, in a collaborative process by students, teachers and researchers. According to Lieberman (1992) we may need to employ a "translator" to achieve this task:

. . . someone who although excited about concepts, big explanatory ideas, and small mini-theories, also had the 'head' of a teacher or principal and was comfortable with the ambiguity and messiness of schools. (p. 6)

Clearly, neither current schools nor universities are organized for collaborative curriculum planning. Such a collaborative process may, in fact, require major reorganization of teacher education programs and school programs to permit such collaboration.

In order to step outside the structures that resist change, and to look objectively at creating an improved school environment, Brown (1991) suggests that we compare reform policies currently binding our schools with policies that really work, such as those used in successful business and current social endeavors. In so doing, he argues, changes made will lead to a "literacy of thoughtfulness" (p.232). Brown's definition of literacy of thoughtfulness includes as essential, the capacity to think creatively and to exercise judgement. Following a visit to schools across North America, Brown illustrates a close relationship between portraits of rich classrooms and a vision of how public policy can encourage thoughtfulness in schools. He describes a high school's main goal as the "literacy of thoughtfulness", the struggle to develop more "thoughtful" students. As an illustration of a school that has initiated such change, and integrated several disciplines, Shorecrest High, is discussed in the following section.

2.1.1.2 Change at Shorecrest High School

Notwithstanding the obstacles to change and the serious difficulties posed by any attempts for high school educational renewal, an increasing number of schools are modeling their curriculum after Gardner's (1984) MI Theory. Change at *Shorecrest High School* in Seattle, Washington, for example was founded on the premise that the opportunity to learn together should be shared by learners of diverse racial and socio-economic backgrounds, as well as diverse academic abilities.

In 1988, *Shorecrest* launched a six-year project to redesign their school in order to increase student and teacher empowerment, and to make continuing curriculum changes to accommodate the diverse needs of students and a changing society. The purpose of the *Shorecrest* project was to restructure the curriculum so that students would be able to: develop individual differences; increase involvement in their own learning; increase involvement in curriculum matters with parents and community; and, make connections between traditionally segregated bodies of knowledge.

Four years after the implementation of an integrated curricular model based upon MI theory. Shorecrest High School Progress Report (1992) identified the following changes:

- Increased focus on leadership development involving a greater number and greater diversity of students. These included student body officers, homeroom representatives, Big Brother/Sister roles, Leadership team, strand leaders
- Greater exposure to the community through service and enrichment opportunities

- Increased focus on career planning: student portfolios, integrated career curriculum in a variety of courses, site visitations, and an open career centre at the school
- Significant change in audience behaviour through theatre enrichment opportunities
- Increased number of National Merit Scholar Finalists
- Improved performance by students on the entrance tests in mathematics and foreign language at the University of Washington
- Increased student connections with students around the world often through video and telecommunications use
- Increased involvement of students in academic tutoring
- Increased focus on building 9th grade school success through attention to learning style, time management, cooperative learning and self-esteem building.

Within the first four years, the drop out rate decreased by 50%. Shorecrest experienced change from a high school that: specialized to one that integrates; was passive in its learning to one that fosters active learning; searches for certainty to one that tolerates ambiguity; was competitive to one that is collaborative; and, practiced rote learning to one that promotes problem solving. The conventional, inflexible curriculum at Shorecrest gave way to a more ethnocentric and flexible curriculum. Shorecrest increasingly emphasized the global over a more local curriculum. In a somewhat similar manner to the Shorecrest reorganization, this study has considered curriculum change in high school.

2.1.2 Integrative, Theoretical and Practical Contexts

Three main tasks are central to this section: to describe how the term curricular integration is used in this work; to explain what constructivism, and an MI Theory view of learning contribute to the study; and, to show how each of the latter theories is expressed in the *Year 2000* Documents. First, the identification of a rationale for curricular integration. This section defines the term "integration" and distinguishes between the notions of, "personal" and "curricular" integration. Second is the development of a constructivist view of learning, which emphasizes the learner's active construction of knowledge. Constructivism is explored as an overarching view of learning within which an MI Theory view of learning is nested. An MI view of learning, which adds that knowledge can be expressed in at least seven possible ways, is examined, particularly as it accommodates the active construction of knowledge. Such construction of knowledge in an MI view of learning, is manifested through the development of students' individual differences. Third, through an examination of the *Year 2000* Documents, constructivist and MI Theory learning approaches are considered as they combine to accommodate student individual differences within this practical policy context. These tasks are addressed in three broad and inter-related contexts: the curricular integration context; the theoretical context; and the practical context.

2.1.2.1 An Integrated Curriculum Perspective

An essential assumption of an integrated curriculum is generally that through integration students experience the topics from several disciplines in a connected way (Jacobs, 1989). This assumption is initially explored in the study in terms of students seeing the connectedness of things in relation to their own particular interests and abilities

and through the notion of personal integration, or the belief that individuals construct explanations through building on prior knowledge and experiences in this study. A second form of integration curricular integration is also discussed. It refers to the connections made in order to bring together various segments of the curriculum into a meaningful whole. This chapter illustrates a few of the many arguments in favour of personal and curricular integration, as well as outlining some cautions against integration in the high school. Furthermore, since the concept of integration holds multiple layers of meaning, various definitions will be provided in order to illustrate how curricular integration relates to this study and how it does not.

2.1.2.2 A Theoretical Perspective

The second, or theoretical context, (discussed further in section 2.3) outlines constructivism and MI Theory as the research paradigms through which curriculum integration is perceived. In addition to displaying the research paradigms that undergird the study, this section will also describe the assumptions and values which are brought to the research enterprise. The central assumption here is that students might find more opportunities to develop their individual differences through an MI approach to learning. Simply put, if the present perimeters within traditional high schools were to move toward a philosophy based on MI Theory, students' abilities and interests would be more readily accommodated since MI Theory postulates the existence of at least seven intelligences, logical-mathematical, linguistic, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal.

2.1.2.3 A Practical Perspective

The third, or practical context (further discussed in section 2.4), relates to the educational reform movement and particularly to the curriculum changes proposed by the British Columbia's *Year 2000* Graduation Documents. This section will identify and illustrate a variety of integration models and illustrate the need for an expanded model. According to Jacobs, this expanded structure would show students not only the "strength of each discipline perspective in a connected way" (1989), but also the rewards of approaching any subject in at least five ways: through narrative; through logical-quantitative approaches; through philosophical, foundational inquiries; through an aesthetic point of view; and through an approach that draws upon student experiences (Gardner, 1991).

2.1.3 Positioning the Research Questions

Chapter 2 "refines and redefines the research questions by embedding those questions in larger empirical traditions," through a strategy suggested by Marshall and Rossman (1989, p. 35). The goal here is to show the "bigger picture", and to relate this study to previous research. In order to illustrate what has been done, as well as show how the present study will contribute to existing knowledge, the literature review is divided into curriculum integrative, theoretical and practical contexts. These three contexts, together demonstrate or reveal the need for an in-depth descriptive study of how students' individual differences are accommodated in high school curriculum. That is, there is a gap in the current literature generally concerning the development and accommodation of individual differences at the high school level. This study argues that MI Theory is a useful approach to developing student differences at the high school level.

The literature review reveals that many previous research studies have focused on only the first of the three perspectives informing this thesis: integrated curriculum, constructivism, and MI Theory. However, there is remaining a need to identify from previous research the potential relationships and interaction among these. This study will examine the application of MI Theory within an integrated curriculum approach in the high school setting.

2.2 Rationale for Integration: A Curriculum Integration Context

While exploring the significance of integrated curriculum approaches, some investigators (Jacobs, 1989, Erickson & Shultz, 1991, Fogarty, 1991, Miller, Cassie, and Drake, 1990) have found that among high school students, there is a positive relationship between an integrated curriculum approach and a more relevant, less fragmented, and stimulating experience for students. Curricular integration, according to Jacobs, and Fogarty, includes: interdisciplinary (connections between subjects), weaving (infusion of technology or learning resources as a thread through subjects), thematic (common topics used to connect interrelated wholes) or advance organizers (students develop their own personally relevant projects related to common organizers across the disciplines).

According to Ragan (1986), any discussion of curriculum integration also requires a common agreement of what exactly is meant by the term "integration." He argues, in fact, that it is not the curriculum that is integrated, and so he suggests the term "integrated curriculum" is a misuse of terms. The person, and not the school subjects, he argues, should be the focus of integration. That is, the integration of an individual in relation to self and to the environment, is the subject of integration. In personal integration, learning is related to concepts within the learner's own existing knowledge

base. Learners construct their own ways of learning both on their own and in interactions with others. It is the student who organizes learning methods at high school in relation to his or her own individual learning styles. Teachers, on the other hand, act as guides and resources. Simply put, personal integration is a process of making meaning, by building on prior knowledge or experiences, and as such, is the same as one of the primary components of constructivism.

2.2.1 Integration According to Good, Bruner, and Jacobs

The literature generally relates integration to the bringing together of parts into a whole (Jacobs, 1991, Ackerman, & Perkins, 1989). But there are differences stated concerning what parts are brought together and how the process of integration might take place. For example, Good (1973) supports the notion that integration involves a cut across subject-matter lines to focus upon broad segments of study that combine curriculum parts into meaningful association. Based on Bruner's (1975) view that disciplines are necessary for knowledge acquisition, and that disciplines are fundamental in order to learn how things are related, Jacobs (1989) stresses, not delineations, but linkages. Jacobs made the following distinctions:

CROSSDISCIPLINARY: Viewing one discipline from the perspective of another; for example the physics of music and the history of math (Meeth, 1978).

MULTIDISCIPLINARY: The juxtaposition of several disciplines focused on one problem with no direct attempt to integrate (Piaget, 1972; Meeth, 1978).

PLURIDISCIPLINARY: The juxtaposition of disciplines assumed to be more or less related; e.g. math and physics, French and Latin (Piaget, 1972).

TRANSDISCIPLINARY: Beyond the scope of the disciplines; that is, to start with a problem and bring to bear knowledge from the disciplines (Meeth, 1978).

(p. 8)

Jacobs' (1989) definitions represent important differences in the way the term "integration" is viewed. Figure 2.1 identifies the two integration views used in the study as the crossdisciplinary and the transdisciplinary. While the multidisciplinary and pluridisciplinary are not germane to the study, their identification is useful in order to illustrate additional integration designs that exist. It is also useful to show the integration approaches not used in the study in order to clarify the approaches used. While, it may appear that there are few differences between Jacobs' definitions for multidisciplinary and transdisciplinary, the two are distinct in approach. In a multidisciplinary approach, Jacobs' would identify the subject areas involved in each teaching activity, so that different subject area teachers could look at the common theme and identify where it fits in. An English teacher, for example, would look at a theme such as "Light" and first locate the place for her subject area, in order to develop teaching strategies for English to teach on the topic of "Light". In a transdisciplinary approach, however, there is no real division into subject areas, nor is there a breaking down of ideas to their smallest parts. The content and the theme, in this approach, are one and the same, with no automatic divisions into subject areas. The teachers, however, will probably make such divisions, in cases where there is no connection between one discipline and another. According to Jacobs' the transdisciplinary approach shares common themes, strategies and skills, and the important objective of this stage is making connections.

If the term "integration" is not clearly defined one can expect to encounter two difficulties in conceiving or developing an integrated curriculum. The first problem is what

Jacobs (1989) describes as the "Potpourri Problem", where many units become a sampling of knowledge from each discipline, and consequently all units lack focus. The second, is referred to as the "Polarity Problem", where "traditionally interdisciplinary and discipline fields have been seen as an 'either/ or polarity', which has promoted a range of conflicts (p. 2)." According to Jacobs, two conflicts result when integration is not clearly defined. The first conflict is the lack of clarity, which results from the absence of a clear scope and sequence and solid evaluation scheme. The second conflict, that arises, is inevitable tensions among teachers, who feel threatened as new views of their subjects are promoted.

While it can be argued, that the world does not completely organize itself according to the disciplines or the traditional school subjects (Case, 1991), it can also be stated that there is a need to show students how different subject areas influence their lives (Jacobs, 1989). The concept of integration, used in this study, supports the view that there is a need for both interdisciplinary and discipline-based curriculum in secondary schools. Further, investigators such as Gardner (1991), Perkins (1989), Campbell, Campbell, & Dickinson (1992), argue that students be provided opportunities to experience the strength of each discipline perspective in a connected way. Jacobs, (1989) suggests not only why, but how curriculum integration might be designed. She illustrates ten distinct views for integrating the curricula. According to Jacobs', how one views curricular integration in operation, determines how connections are made. The above descriptions are extrapolated by Fogarty (1991) from the book, "Interdisciplinary Curriculum: Design and Implementation" (Jacobs, 1989), and illustrated in Figure 2.2. What would the model in Figure 2.2 look like if one theme was chosen to represent a unit topic? Jacobs' (1989) interdisciplinary concept model organizes each theme around a traditional high school

strand, such as mathematics, the arts, social studies, language arts, or humanities/philosophy.

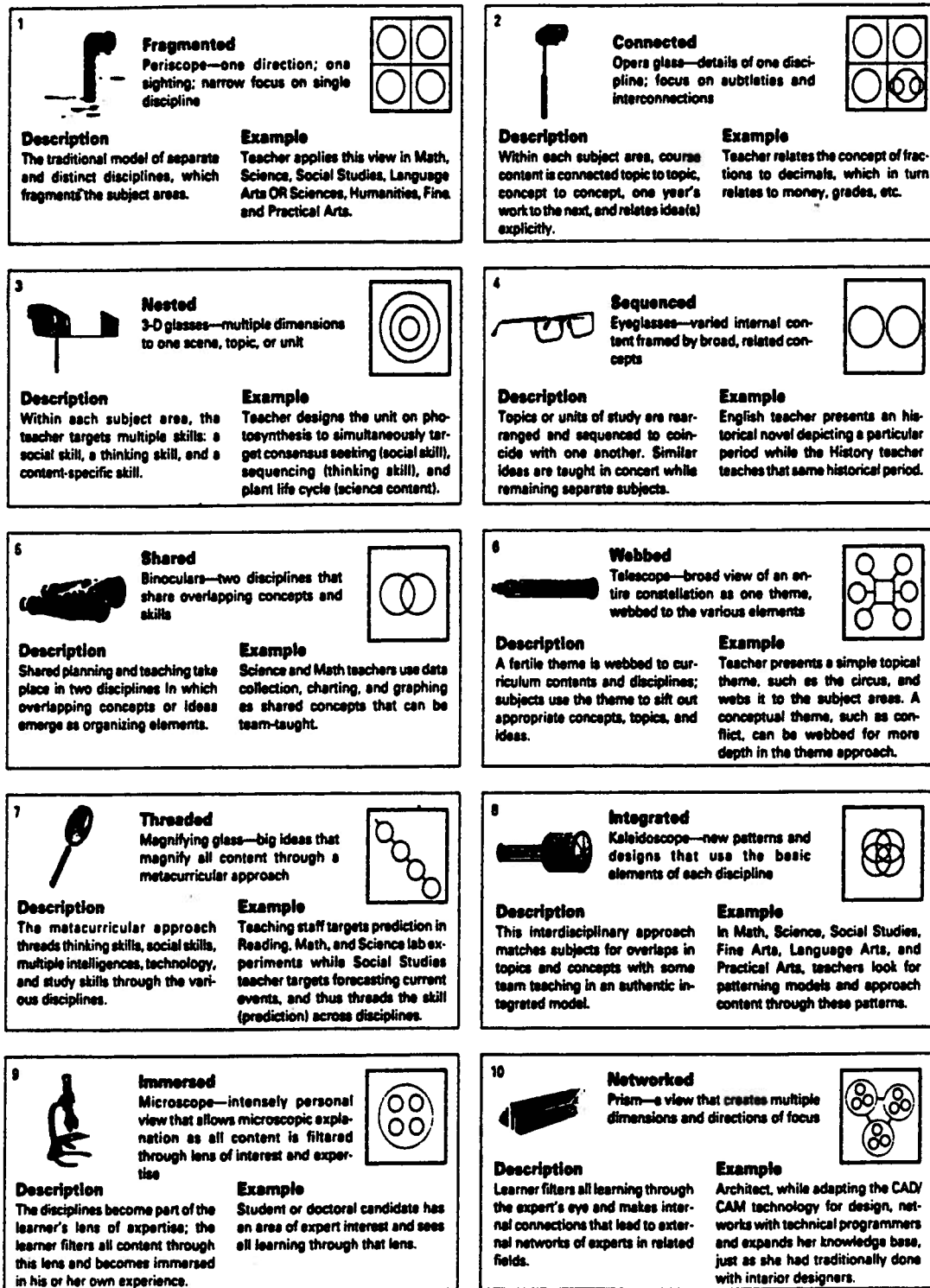
Themes within Jacobs' model (see Figure 2.2) prompt students to examine problems in collaborative ways, as well as to identify additional issues related to each problem. The model provides opportunities to examine each chosen theme through a variety of lenses. In other words, a curriculum that employs thematic approaches to look at a topic such as, "*Canada's Fishing Industry*", might consider the fishing industry from the viewpoint of the Canadian government, a typical fish farmer, and a biologist, and then contrast these perspectives with a Native Canadian's opinions about fish farming in Canada.

According to Miller, Cassie & Drake (1990), an interdisciplinary approach is one useful method of dissolving boundaries in many different areas using a multidisciplinary, interdisciplinary, or transdisciplinary approach. Jacobs distinguishes among several interdisciplinary approaches. As previously discussed, the multidisciplinary approach, for example, labels all disciplines around one common theme, which begins with subject specific teachers providing their particular perspectives, and subsequently moves into connecting contents in order to expand the thematic framework.

2.2.2 Personal Integration and Curricular Integration

The descriptions of integration discussed above, identify a number of additional ways in which to view curricular integration, both personal integration, and subject or discipline integration. One further distinction, however, may be useful in order to separate and discuss the multiple layers of meaning concerning the concept of integration. It would be helpful to distinguish between various types of integration - particularly personal

Figure 2.2: Toward an Integrated Curriculum



© Robin Fogarty, 1991*

*Extrapolated from "Design Options for an Integrated Curriculum" by Heidi Hayes Jacobs in *Interdisciplinary Curriculum*, Alexandria, VA: ASCD, 1989.

integration and curricular integration. The Discussion Group on Integration for the Primary, Intermediate, and Graduation Programs (1992), suggested in *Curricular Integration: An Outline for Discussion*, one useful distinction between the two. Personal integration, by the team, is defined as:

a process of meaning making, or making learning relevant. It is grounded in the belief that, as human beings seek to make sense of what they do not understand, they construct explanations; they "build" upon prior knowledge and experiences. Such meaning making is accomplished individually and with the help of others. (p.8)

Personal integration, and its application to curriculum integration, is discussed later in this chapter under the title, "Constructivism". An important question raised is: what opportunities does an integrated approach provide for each learner? That is, what opportunities are there for learners to integrate this experience with their prior knowledge in their own way?

2.3 Constructivist Learning Approaches: A Theoretical Context

It is important to highlight the particular contributions of constructivism to the study. Simply put, what does a constructivist perspective contribute to this study? Furthermore, how does constructivism address student individual differences? Finally, how does constructivism differ from MI Theory, as each is described in the literature, specifically in relation to traditional learning approaches? This section addresses each of the previous questions, in order to provide a theoretical context for the study.

2.3.1 A Constructivist View of Learning

According to Doyle (1983), a constructivist view of learning is a process which involves actively seeking meaning from (or even imposing meaning upon) events. In a review of literature concerning academic tasks, Doyle summarizes an emerging constructivist theme in education with the following characteristics:

1. Comprehension of texts is an active constructive process, not merely reception or rehearsal of information. Personal knowledge of the world is organized into associational networks or schemata;
2. Prior knowledge always plays a significant role in this process of construction, in problem solving, and in learning. One of the major findings of research in this area is that domain-specific knowledge plays a central role in problem-solving and learning within a content area;
3. Solution strategies are learned 'naturally' through experience; from these natural strategies, learners invent procedures for solving routine problems. Sometimes these problem-solving strategies are systematic, but wrong;
4. Academic work requires both domain-specific knowledge and complex solution strategies;
5. Age and ability of the learner influence objective complexity of academic tasks. Mature learners are selective and efficient in extracting information relevant to a task, less mature learners attend to a broader range of stimuli and are less likely to select and process information to fit the demands of a particular task. (pp. 166-172)

In summary, Doyle (1983) suggests that constructivist learning is based on a system of personal constructs, associational networks or schemata, which is constructed and modified on the basis of experience and prior knowledge. The constant dialectical interplay between the learner and the curriculum, then, is at the heart of constructivism, and such communication is critical to learning, according to Doyle. Yet why have high schools not implemented a constructivist approach to learning on a broad scale? More importantly, what are some of the barriers to constructivist practice within conventional high school practice? In order to highlight some of these barriers, it is useful to illustrate several examples of a constructivist approach that is sometimes existent in high school.

An illustration of constructivism that sometimes can be found in high school curriculum, is Vygotsky's (1978) notion of the construction of knowledge that is possible when one learner actively engages with another. This approach was expressed in the famous statement that "every function in the child's cultural development appears twice: first, between people (interpsychological), and then inside the child (intrapsychological)" (p. 57). To illustrate this, Vygotsky cited a notion proposed by Piaget (1970), that a child's ability to construct differing viewpoints requires actual intellectual arguments between children and/or adults. In a constructivist curriculum, a student might be given a set of equations, such as $(x - 2)(x - 7) = 0$ or $x(x - 11) = 0$, and be required to find the solution sets for all possible values of x . The students might work with peers to identify the "zero law", which states that anything multiplied by zero must equal zero. Or they might identify other mathematical rules that would explain their work. The goal is that students would learn the rules by actively constructing knowledge, by weighing new information against their previous understanding, and by working through apparent discrepancies, in order to come to new understandings. It is important to note here, that

constructivist learning is not without objectives and goals. According to von Glasersfeld (1989), even *discovery learning* connotes an objective reality to be discovered. Candy (1991) argues that the tasks merely shift for the constructivist learner from providing descriptions of the constructs learned, to constructing new knowledge based on existing understandings and the curriculum to be learned.

Other illustrations of constructivist ideas that find expression in conventional high school curriculum might be: construction of long chains of reasoning through the use of various math skills learned; creation of poetic compositions that rely on prior knowledge concerning the functions of language; a sculptor's ability to perceive the visual spatial world of art and transfer that knowledge of one's initial perceptions to clay or other media; or the creation of musical notes using prior knowledge of music history, or music theory. Constructivist ideas, however, represent a marked departure from much conventional curriculum, as frontal teaching in a constructivist approach is minimized, and students are expected to construct knowledge for themselves (Duckworth, 1986, p. 489).

According to Duckworth (1983), one key barrier to constructivist practice, is that constructivism has become the new catchword. That is people using the term, Duckworth argues, hold different notions about what constructivism means and how to implement its principles. Another barrier comes from the fact that to use constructivist ideas in curriculum, requires a teacher to reconstruct what she knows about the way people learn, and to change her behaviour based on new paradigms about learning.

2.3.2 MI Theory View of Learning

According to MI theory, all humans are capable of developing to some degree at least seven semi-autonomous ways of knowing the world. Gardner (1986) suggests that a number of intellectual strengths, or competencies, each with its own developmental history, exist. He argues that there are areas of the brain that roughly correspond to certain forms of cognition, each with its own memories. No one way, Gardner suggests, is preeminent over another.

Gardner (1983) describes seven intelligences: (1) **Linguistic intelligence**, includes poetic or journalistic ability, with sensitivity to the sounds, rhythms, and meanings of words and the different functions of language; (2) **Musical intelligence**, includes composition and production abilities as well as the ability to appreciate different forms of musical expressiveness; (3) **Logical-mathematical intelligence**, includes scientific or mathematical abilities - with sensitivity to, and capacity to discern logical or numerical patterns; ability to handle long chains of reasoning; (4) **Spatial intelligence**, or visual intelligence, involves one's ability to perceive objects as they relate to one another, and to create related mental pictures or images; (5) **Bodily - Kinesthetic intelligence**, consists of any way the activity of the mind is expressed through the coordinated action of the body. An athlete, a dancer, or a person who handles objects skillfully demonstrates *bodily-kinesthetic intelligence*; (6) **Interpersonal intelligence**, refers to a person's relationships with others includes a therapist's or salesperson's capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people; (7) **Intrapersonal intelligence**, refers to the ability to know oneself, includes access to one's own feelings and the ability to discriminate among them and to draw upon them

to guide behaviour, along with knowledge of one's own strengths, weaknesses, desires and intelligences.

2.3.2.1 An MI View of Intelligence

The work reported in this thesis has not drawn solely on Gardner's MI view of intelligence, but also from theorists such as Bruner (1985) who argued that most people can learn any concept that is expressed within a representation that they use, and Sternberg (1991) who argued that in all forms of intelligent behaviour there exist common basic mental processes at work: perception, memory, and an organization of segments of data. Bruner, Sternberg and Gardner would agree that intelligences are always expressed in the context of specific tasks, domains and disciplines. There is, for example, no pure spatial intelligence; instead there is spatial intelligence expressed in navigation, or in basketball passing. The assumption that is made is that one is not able to assess intelligence in another person by observing that person in a specific task without specific supports or scaffolding (Gardner, 1984).

Intelligence, as defined by Gardner (1983), and which will be used throughout this study is defined as: *the ability to solve problems and to create a product that is acceptable in at least one or more cultures* (p. X). This definition, supports an open-ended criterion, since Gardner challenges the validity of the construct "general intelligence", and he argues that one should try to incorporate the full range of human intelligences. Concerning intelligence, both Gardner and Sternberg argue that teachers should make explicit information that has previously been kept implicit. Gardner argues that students do not automatically transfer knowledge from one situation to the next, and must be provided opportunities to apply knowledge in a variety of activities. In other words, when

teachers provide opportunities for students to develop strategies for solving problems and creating products, students are more likely to transfer knowledge from one setting to another.

Sternberg (1991), while supporting in part Gardner's view of intelligence, argues that MI Theory relies too heavily on subjective judgement for its definition, and should rely more on tests, or scientific factor analysis, in order to define intelligence. Both Gardner and Sternberg, however, agree that the point of departure on any theory of intelligence is theory rather than tests. In other words, both agree that the tests used in establishing correlations between success patterns and intelligence are less useful than proven theories of intelligence which consist of constructions, connected in a complex fashion, with data and observations, on which they were formulated.

While this study does not include a detailed debate on the meaning of intelligence, in general, the study supports the view that intelligence is composed of many different abilities that operate more or less independently. This view holds that while people may be good at one ability such as verbal fluency they may not perform well on another ability such as visual - spatial ability, or the ability to accurately perform transformations of one's initial perceptions.

2.3.3 Individual Development: Gardner, Piaget, and Bruner

In order to explore MI Theory as it relates to student individual differences it is useful to contrast MI Theory with more traditional approaches to learning, and identify MI Theory roots, as they are grounded within a constructivist learning approach. Gardner's (1991) conception of intelligence considers three critical education issues, *individual development, personal growth, and different learning styles*. (p. 146) Concerning the first

issue, *individual development*, he suggests that any student would provide persuasive evidence for the existence of several relatively autonomous human intelligences, if individual differences were recognized and encouraged. Secondly, a student's personal growth is determined by the recognition and encouragement of individual abilities. How can teachers accommodate such diversity? This question leads to the third educational issue; Gardner suggests that the use of different learning styles is one way to facilitate the development of more student abilities. This conception of intelligence differs from the notion of Piaget's structural approach, which states that children progress through four stages of mental development, each one building on the previous stage. The four include: the sensorimotor stage (from birth to 18 months); the preoperational stage (18 months to 7 years); the stage of concrete operations (7 to 12 years), and the stage of formal operations (from about age 12 onward) (pp. 44, 62 & 90). Gardner argues that Piaget's is a restricted view, as explained in the following section.

Initially Gardner (1983), like Piaget (1970), postulated child development was governed by general structures of the mind. After much empirical research, however, Gardner, shifted from Piaget's structural approach to explain individual development, and agrees with Bruner (1985), who argues that there exists a large and relatively unconnected set of mental skills. While Gardner (1991) admits that Piaget further extended the tent pegs beyond earlier definitions of intelligence and cognitive development, he argues that Piaget's model of development is only accurate within a very restricted domain. Perhaps the most significant difference between Gardner's and Piaget's perceptions of a child's development lies within their respective views of a child's cognitive schema. Schema, as it is used here refers to an organized pattern of behaviour, in the child's cognitive organization and structure, which gradually changes as a function

of his or her experience. Piaget argues that cognitive structures (or four stages of cognitive development) are arrived at through the processes of assimilation and accommodation. In assimilation the child fits the new knowledge into an existing schema or mental structure, whereas in accommodation the structure is altered in some way to accommodate the new knowledge. At times both assimilation and accommodation occur simultaneously. If, however, the new knowledge exceeds the child's ability to assimilate it, the child often faces frustration. As a structuralist, Piaget looked more at how the parts are organized into the whole, whereas Gardner, like Bruner, argues that when a child sees the whole he or she better understands the parts. That is, knowledge that is obtained in a holistic fashion is better understood by a student, than knowledge that is divided into segregated parts, without acknowledging or understanding the whole.

Furthermore, Gardner (1983) argues that Piaget (1970) has ignored the developmental "steps entailed in achieving other forms of competence -- those of an artist, a lawyer, an athlete, or a political leader" (p. 20), for example. Simply put, Piaget emphasized only one limited form of thinking, and ignored other forms of thinking, such as musical, spatial, bodily-kinesthetic, interpersonal and intrapersonal. In contrast to Piaget's fixed stages of development, Gardner (1983) suggests that "individual stages are achieved in a far more continuous and gradual fashion than Piaget indicated" (p. 20). According to Gardner, one finds little of the discontinuity Piaget claimed, and in fact, "most tasks claimed to entail concrete operations can be solved by children in the pre-operational years, once various adjustments have been introduced into the experimental paradigm" (p. 21). Gardner questions the apparent conflict between Piaget's skepticism about I.Q. items couched in language, on the one hand, and his tasks usually being conveyed verbally on the other.

Piaget (1970) described development in a fixed progression which proceeds at its own rate. Once transition is made to the new stage the previous stage is subsumed into the new one and no longer exists. Gardner's (1983) multiple intelligence theory borrows more from Bruner's (1985) concept attainment model, than from Piaget's fixed stages. The use of Bruner's model would enable students to formulate and acquire concepts by inductively investigating examples and counter-examples.

Like Bruner's (1985) model, Gardner's (1983) MI Theory, when applied to the context of an interdisciplinary studies design, provides a framework to address student individual differences. In order to further explore how MI Theory might optimize education of individual student differences, and how it contrasts with more traditional approaches, it is useful to consider MI Theory roots, as these are grounded within a constructivist approach to learning. Not surprisingly, the four teachers in the study, while they did not use the term "constructivism", did use the constructivist principles outlined in the following section in order to develop an integrated curriculum based on one common theme.

2.3.4 Constructivism, MI Theory, and Interdisciplinary Teaching

A curriculum that incorporates a common thematic unit, and combines a constructivist and MI Theory view of learning is based on three principles. These three involve: students' prior knowledge; seven ways of knowing; and, a recognition of relationships that exist among the disciplines. *First, it provides an opportunity whereby students can weigh new information against their previous understandings.* Students are guided to use simultaneous disciplines in order to come to new understandings about each discipline. Constructivism's key tenet, that students learn by actively constructing

knowledge, weighing new information against their previous understanding, and coming to a new understanding through working out discrepancies both individually and collaboratively, provides a framework, through which curriculum construction and implementation can proceed. An illustration of one such framework that might result from a constructivist approach to curriculum would be the use of an individual profile approach to document and report each student's previous knowledge and prior experiences, as a first step in developing new skills.

A curriculum based on constructivism does not mean that students learn different material, but that they learn in different ways, and within different time spans. According to Benson (1989), while constructivism assumes that no two people possess the same knowledge base and therefore assumes that students construct knowledge in different ways, constructivism does not imply: "that individuals do not have similar understandings; (but) what it does say is that knowledge creation is an individualised process and situational factors influence knowledge creation" (p. 330). Constructivism does however imply that, while students may learn the same materials, they probably will not learn that material in exactly the same way.

Second, it requires students to learn in at least seven ways, and to thereby become thoughtful participants of their own work. Participation, according to Gardner's (1991) MI Theory approach extends beyond individual student construction of meaning, to include the idea of community involvement in curriculum (p. 256). Learning, according to Gardner is a lifelong process, for students, teachers and the community (p.193). Participants, for example, might be encouraged to pose questions, make judgements, integrate criticisms, and reconsider problems while investigating new possibilities for their own learning (Gardner). Teachers using constructivist or MI Theory, for example, would

most likely design classes in order to shift responsibilities to promote student-centered learning by allowing students to come center-stage thereby transforming the "current teacher-centered learning that still exists in many schools" (Zessoules, 1991).

How, we might ask, do the application of both constructivism and MI Theory imply change from the conventional high school curriculum? For each of the previously described principles, it can be concluded, mandated curriculum would shift from its traditional role as an end product into the more flexible role of providing springboards into deeper understandings. In other words, individual approaches to learning would become central to the curriculum design. An illustration of how curricular and instructional designs are bridged would be the construction of curriculum around one common theme, such as "Light" for a grade 8 unit. In such a unit mandated curriculum topics would become springboards. The use of one theme in this manner, would illustrate how students' knowledge acquisition can be expanded through the use of variety of learning activities using MI Theory.

While MI Theory, for example, provides a means by which high school curriculum might accommodate the development of student individual differences, constructivism emphasizes the importance of the learner's active construction of knowledge. Constructivism, which conjectures that there is an interplay between new knowledge and the learner's prior knowledge, contributes the natural foundational underpinnings for consistent curriculum changes. The MI notion of a carefully constructed understanding of the world through which people interpret their experiences is central to the constructivist view of learning (Benson, 1989, p. 329). Constructivist teaching approaches differ from traditional high school teaching approaches in several significant ways including: (a) constructivism's greater emphasis on learning as an active,

constructive process carried out by individual learners (Von Glasersfeld, 1989); (b) constructivism's recognition and utilization of each student's prior knowledge and past experiences in learning; (c) and constructivism's concern for the bridges between curricular and instructional designs as well as each student's learning experience (Tennyson and Rasch, 1988). With both MI Theory implementation, and constructivist practice, is recognized the considerable time needed to settle on central organizing concepts and to plan strategies so that students will have more opportunities to "construct" their own meaning. Duckworth (1986) identifies some of the barriers involved, as teacher's pressure to cover mandated curriculum, to juggle what is really important and to please the school administration.

Third, a curriculum based on constructivism recognizes the relationships that exist between bodies of knowledge. When a high school enters the beginning stages of a major shift from the traditional discipline structured organizations toward a more interdisciplinary model, where assessment of individual profiles is encouraged, teachers are pressed to consider natural passageways from the learner's individuality as it is expressed in meaningful connections between disciplines and between individual abilities and the curriculum content. Concerning the movement to link the disciplines and to help students see the connection increasingly in high schools, Drake (1991) suggests that more and more high school teachers are working toward dissolving the boundaries that once separated subject areas. Based on the argument that high schools have traditionally structured knowledge in a piecemeal fashion, and that high school disciplines come together naturally within a thematic approach to teaching, Jacobs (1989), and Fogarty (1991) have developed several strategies for making the disciplines mutually reinforcing. The interdisciplinary designs are based on the fact that unlike the typical high school day,

the world is not divided into discrete disciplines. Clearly, as it has been previously argued, disciplines may be necessary in order to organize and present the vast bodies of knowledge required at the high school level. This study does not contest that proposition. I am, however, concerned about the absence in some schools of an alternative, such as interdisciplinary studies, which would break down barriers between some disciplines, and where possible, frame knowledge in a more holistic manner (Fogarty, 1991; Jacobs, 1989).

Through the use of integrated curriculum, teachers can explore ways to "transcend rigid discipline boundaries," (Jacobs, 1991). While most of the interdisciplinary efforts have been made in the elementary and intermediate grades, where movements such as whole language have opened the way toward application of interdisciplinary studies, fewer such efforts have been made at the high school level. Jacobs and Fogarty (1991) attribute the success of integration in part to the students' enthusiasm for learning. Integration, they say, increases student motivation.

Concerning, student individual abilities, the interdisciplinary model, according to Jacobs (1989) sets the stage for MI Theory Learning, through a variety of different intellectual proclivities, through a number of modalities and a wide design of instructional experiences such as lecture, group projects, discussion, research, or design "to encourage both individual and cooperative learning." (p. 63). The MI theory analysis suggests that we are all able to know the world through language, logical-mathematical analysis, spatial representation, musical thinking, the use of the body to solve problems or to make things, an understanding of other individuals, and an understanding of ourselves.

It should be noted that not everyone agrees with the arguments in favor of integration. In fact, efficiency, instead of effectiveness, is at times cited as a just cause

for creating separate disciplines. "Efficiency," according to Jacobs (1991) however, is dependent on effectiveness. That is, while a teacher may cover certain materials, students may have derived little from it. Grant Wiggins, director of programs and research at the Centre on Learning, Assessment, and School Structure (CLASS), cautions that some barriers between disciplines may be useful (Jacobs, 1991, p.4). Wiggins also argues that interdisciplinary study is not in itself more motivating. Citing the case study method used at Harvard Law School, which is closely tied to the real world, yet subject specific, Wiggins argues that better attention to content and context "can make discipline-based instruction as relevant and motivating as integrated curriculum is touted as being." (p. 4) Is it possible, that because of the resistance to change in high school practice, (Cuban, 1991, and Fullan, 1990), that Wiggins' suggestions for integration within individual disciplines might be a better way to begin the process of integration in the high school. Such a consideration may be useful since change is often a slow process, (Fullan, 1991) rather than a single event, a proposition supported by the study.

2.3.4.1 Resistance to MI Theory Encountered

It is generally held that there are three significant obstacles to achieving recognition of, and teaching for, individual student differences in high schools; firstly, the myth that education must return to the basic mastery of the Three R's (Bibby & Posterski, 1992; Brown, 1991; Gardner, 1983; Gardner & Hatch, 1986); secondly, the organization of most high schools around particular and segregated disciplines - a disconnected approach to curriculum that has "so paralyzed our thinking to the point that a language for describing alternatives is barely visible" (George, Stevenson, Thomason, & Beabe, 1992, p.87); and thirdly, the emphasis on testing for students' weaknesses, rather than

promoting strengths (Brown, 1991; Gardner, 1987; 1991; Hatch & Gardner, 1986). A plausible response, according to Dickinson (1991) is that high school students be provided opportunities both for creative exploration of their interests and abilities, as well as opportunity for learning valued skills and concepts, through multimodal means.

Simply stated, if teaching practice is to reflect what we now know about learning, an alternative approach may be useful, to temper our concerns with the three R's with our "concern for how well today's young people are combining these old skills with the new means available to them. . . ." (Bibby & Posterski, 1992, p. 71). Projects that are inherently multi- or inter - disciplinary in character, rather than the high school's "traditionally" more mechanistic approach are likely to characterize a curriculum concerned more specifically with student individual differences. One example is a recent high school curriculum proposal that will: "stress the importance of thinking, solving problems, inquiring, working with others, using language in all its forms, working in a multicultural environment, and being active, independent learners" (Brown, 1991, p. 212).

If the central aim of education is to help students to learn, rather than to assess and report on what they do not know, evaluation methods will have to change. Both Gardner (1991) and Eisner (1993) argue for a more authentic assessment, one that relates to the topic learned, for example. On this topic, Eisner (1993) suggests eight criteria for creating authentic assessment. Assessment, according to Eisner, should include: a relationship to tasks in the world outside schools; the process used to solve a problem; the community values from which the tasks derived; group efforts at times, rather than solely individual performance; more than one acceptable solution to a problem; boundaries beyond the curriculum as taught; a sensitivity to wholeness rather than segregated parts; and, a variety of representations. Eisner's assessment criteria can be considered a part

of the learning process, rather than a one-time evaluation, following a lesson taught. This process of authentic assessment would augment the conventional pattern of testing, with its "admiration for the virtues of quantification", (Eisner, 1993, p. 220) toward an assessment procedure "that has more educational validity than those we have been using" (p. 224).

Regarding the matter of tests, Gardner (1991) argues that psychologists spend far too much time ranking and too little time helping kids. Rather than more and more sophisticated tests to show what students do not know, MI Theory argues for a wider variety of teaching and evaluation methods that would give students an opportunity to handle and manipulate materials. The assumption here is that learning should begin at a person's place of strength, (not of weakness) in order to help students learn things in ways they can understand. Some teachers will undoubtedly question students' ability to be able to consistently choose what is most helpful for their development. Others may protest that if students' are provided with too many choices they will make poor choices. Furthermore, what about the significance of diagnostic testing and pre-tests? Further research would be required in order to respond to these important issues in more depth.

This study examines constructivism and MI Theory, with a particular emphasis on MI Learning theory's possibilities for providing one framework through which high school curriculum might be reorganized in order to address individual student differences. A plausible assumption, argued throughout the research, is that as long as high schools recognize only a limited kind of intelligence, (for example verbal and logical, mathematical) as Sternberg (1985) suggests, students whose intelligences are concentrated in modalities other than those championed, are disadvantaged. In other words, "When you limit the games to basketball, the kids who are 3'2" are going to be handicapped" (1990,

p. 26). The study explores MI Theory as one force that, as Eisner argued will, "exploit the power of the curriculum to optimize whatever potential intelligences individuals possess," (Fowler, 1990, p. 27). The literature explores some of the barriers to implementation that are met within the traditional high school curriculum organization, and then posits several conditions which would necessarily attend such an effort.

The fact that high schools resistant to change are in trouble is claimed by some (Brown, 1991; Dickinson, 1991). But, in spite of the recognition of needed change, high schools in North America have tended to resist change (Sarason, 1990). Cuban (1982) charged that today the high school's typical day often closely resembles that of decades ago, in spite of intermittent attempts at structural changes. According to Cuban, the educational system self-perpetuates, in spite of the many proposals for change especially during the past decade. The focus of the following section, is on one proposal for change in British Columbia's high schools, as outlined by the *Year 2000* Documents. This change process is examined as it focuses on the individual student in relationship to the many partners in education.

2.4 Year 2000 Proposals: A Practical Context

This final section will examine the *Year 2000* Documents, as a useful plan for change in British Columbia's secondary schools, and as consistent with both a constructivist and an MI view of learning. This section will explore the background to change in British Columbia, examine the change process associated with the *Year 2000*, and illustrate the ongoing *Year 2000* educational improvement commitment processes in the graduation program. The *Year 2000* Documents will be summarized and analyzed in order to demonstrate how the present study is related to one document which

represents wider research on British Columbia's secondary schools. This final section will concentrate on the way this study will contribute to existing knowledge by showing the reader a link between what has been done and what will be done.

2.4.1 The Background to Change in British Columbia

In 1988 a report titled *A Legacy for Learners: The Report of the Royal Commission on Education*, expressed eighty-three recommendations for change within British Columbia's schools. Among the recommendations expressed, was the need to focus on the learner's individual differences, to build on their prior knowledge in order to assist in constructing new knowledge, as well as the need to involve the community more in curriculum - development related issues.

The British Columbia Ministry initiatives, as outlined in the *Year 2000 Documents* were an attempt to design curriculum that would direct teachers energies into those areas in which change is already occurring. The *Year 2000 Documents* were not a debate for or against change as much as they were an attempt to provide structure and direction for the change already taking place, particularly at the grade 10 level.

2.4.2 The Change Process

As a response to the recommendations made in *A Legacy for Learners*, the Graduation Team, after consultations with several interest groups, produced *The Graduation Program: Response Draft..* A five year strategic plan (1990 - 1995) was outlined to improve educational opportunities for British Columbia's schools. As a framework for the proposed curriculum changes, nine underlying beliefs were listed by the Graduation Planning Team from the Greater Victoria School District. The following beliefs

represent the districts' fundamental values: its ethical code, and, its overriding convictions, namely:

- We believe that all individuals have the capacity to learn.
- We believe in the dignity and worth of all individuals.
- We believe that a positive self image is essential for personal development.
- We believe that all individuals can experience joy and satisfaction by striving to reach their potential.
- We believe that parents and the community are partners in education.
- We believe that equitable access to educational opportunity is a fundamental right.
- We believe that safe, healthy, attractive buildings enhance the learning process.
- We believe that learning is a personal lifelong experience.
- We believe that all individuals have power to positively influence the future.

The British Columbia commitment to educational change focused on the individual student in relationship to the many partners in education. The idea in this change plan was to enable students to develop their maximum intellectual potential within a flexible and responsive environment.

2.4.3 An Ongoing Commitment to Change

The British Columbia Ministry of Education began the development of a plan to implement change at the high school levels, after first reviewing the original submissions to the Royal Commission, previously discussed. Responses to that original draft were

sought from teachers, administrators, parents, students and many community members. These responses were used to develop a subsequent plan for the revision of the Graduation Program. In the Graduation Response Draft 2, the ministry states its ongoing commitment as a commitment to build educational programs that focus on individual learners, with emphasis given to:

- knowledge that comes from research and development activities
- wisdom that comes from the experiences of practising professionals
- a range of perspectives that is brought by partners in education, including students, parents/guardians, and members of the community at large.

The final *Graduation Program, Foundations: Partnerships for Learners*, will be released in 1994 by the Ministry.

2.4.4 The Year 2000 Graduation Documents

The goals of education stated in the *Year 2000* graduation program are classified as intellectual, human and social development, and career development. Intellectual development goals seek to develop the ability of students to analyze critically, reason and think independently, and acquire basic learning skills and bodies of knowledge; to develop in students a lifelong appreciation of learning, a curiosity about the world around them, and a capacity for creative thought and expression. The human and social development goals seek to develop in students a sense of self-worth and personal initiative; to develop an appreciation of the fine arts and an understanding of cultural heritage; to develop an understanding of the importance of physical health and well-being; to develop a sense of social responsibility and a tolerance and respect for the ideas and beliefs of others. The

career development seeks to prepare students to attain their career and occupational objectives; to assist in the development of effective work habits and the flexibility to deal with change in the work place (p. 30).

The *Year 2000* goals outlined here, are to be utilized in all facets of the program design implementation, by both teachers and learners. Many of following suggestions for changes are reflected in both constructivist and MI Theory views of learning as well as in the integrated design outlined in the study. For this reason the practical context, *The Year 2000 Documents'* graduation program is examined for its capacity to accommodate students' individual differences.

2.5 Summary and Conclusion

Literature reviewed in this chapter provides two central perspectives used in construction of this research: a curriculum integration view, and two learning theories consistent with that view. Both of these have been significantly restructured following the completion of the field work, the publishing of more current literature, and contributions from committee members, and fellow colleagues. Both of these perspectives were explored in terms of their role in the *Year 2000 Documents*, a current plan for change in secondary schools in British Columbia.

The integration perspective was expressed through Jacobs (1989) model for curriculum integration. Given the context of this study, it was argued that integrated curriculum is:

- crossdisciplinary, or the viewing one discipline from the perspective of another.

- transdisciplinary, or beyond the scope of disciplines, where one starts with a problem and brings to bear knowledge from disciplines.

Two curriculum designs in Jacobs' model not used in the study include:

- multidisciplinary, or the juxtaposition of several disciplines focused on one problem with no direct attempt to integrate.
- pluridisciplinary, or the juxtaposition of related disciplines, such as math and physics.

Following the discussion on integration, two views of learning, the constructivist and MI views were identified as those through which integrated curriculum could be examined. Each of these theories was examined in terms of its ability to accommodate the development of student individual differences at the secondary level (See Figure 2.1).

The *Year 2000* (1991) Documents were examined, as one illustration of a plan for change in British Columbia, consistent with a constructivist and an MI view of learning. A formula for change as described in the *Year 2000* Documents was explored in terms of the development of student individual differences. Research in this area focuses on teacher beliefs that:

- all individuals have the capacity to learn
- parents and the community are partners in education
- learning is a personal, lifelong experience
- a positive self image is essential for personal development

Finally, a view of change consistent with this set of teacher beliefs was developed. That development began by placing the notion of student individual differences in context,

and identifying a range of factors which promote or obstruct change. Those factors which serve to promote change that would accommodate individual student differences, were identified as:

- a curriculum that builds on students' prior knowledge and experience
- An approach that allows students to approach any subject in at least seven ways
- a curriculum model that shows students connections

Finally, this view of change was explored in terms the development of students' individual differences at the secondary level. Research in this area focuses on the significance of learner's construction of knowledge that is consistent with their experiences. Figure 2.1, discussed at the beginning of the chapter, presents ways in which individual student differences are accommodated through integrated curriculum, constructivism and MI Theory.

In developing this perspective, the study presents a synthesis of three separate but related strands of literature, within three contexts: the curriculum integration context; the theoretical context; and, the practical context. The significance of this work is centered on the development and application of a view of learning based on all three contexts. This perspective responds to the problem identified in Chapter 1, concerning the lack of literature specifically addressing individual differences in high school curriculum. In order to address the research gap, this study presents the combination of an MI theory view of learning, based in constructivism, and implemented within the context of integration. This context which includes constructivism, MI Theory, and integration frameworks, is

developed in order to provide a curriculum approach that addresses the development of student individual differences.

In Chapter Four a model is outlined, in order to implement the learning theory discussed in this chapter, in a practical setting. In this chapter I argue that there is a lack of research in the area of individual student differences at the secondary level, and that the present study seeks to provide a contribution to this area. In the following Chapter I outline the methods used in the present study.

CHAPTER 3: METHODOLOGY

3.1 Overview and Rationale of Methods

Chapter 3 describes the design of the study, outlining the rationale for a qualitative approach, and describes the interview strategies, methods of reporting data, and the research process used. Finally, the chapter addresses questions of validity and reliability. While the study emphasizes students' notions of their abilities, interests, and their high school program, it also considers teachers' perceptions. The emphasis given to students' perceptions resulted from the argument by Fullan (1989), that student perceptions are the missing data in much of the high school change literature.

First, it is useful to examine the rationale for the particular qualitative approach selected in order to address the research problem. A qualitative approach was chosen because the design and analysis of the data progressed as the study went on without a definite plan. According to McMillan and Schumacher (1989) qualitative research, unlike a quantitative approach, is more tentative and open-ended as it often employs an emergent design (p. 519). Therefore, since the study was expected to change and reformulate continually throughout the duration of the data collection, and even beyond, a qualitative approach seemed appropriate. This section will discuss the emergent design, and outline the data collection procedures and analyses techniques. Following, in Chapters 5 and 6, data are reported, interpreted and conclusions drawn concerning the study's problem.

In the past, research concerning change processes within schools has been, for the most part, restricted to the observations and recommendations of researchers. There has, however, been a significant shift in the past decade, to include more teachers in

action-based research (Dickinson, 1991; Schubert, 1986). Few studies, however, included high school students (Fullan, 1990). I conversed directly with students to gain their perceptions of their individual differences in the high school setting, and the curriculum's capacity to accommodate them. The qualitative design provided for the ideas of students and teachers to shape the construction of the MITA model is described in Chapter 4.

A qualitative design was chosen for three reasons. First, it was judged to be the most appropriate way of addressing the research questions of this study. Secondly, a qualitative approach would permit the recording and analysis of the stories of students and teachers. Ravitch and Finn (1985) challenge teachers to allow stories naturally to link specific events to their larger environment, by examining facts on one hand, but considering important connections on the other (p.206). In this study, the students' and teachers' stories were used as the primary data base from which themes and issues were identified.

The third reason for the qualitative design used in the study is that the guiding conceptual world views of constructivism and MI Theory, in which the research in this study is embedded, are both concerned with the construction of meaning by individuals (Candy, 1991, von Glasersfeld, 1989, and Doyle, 1983). It was considered to be essential that the design be sensitive to identifying the meanings conveyed by the students and the teachers in the study. The constructivist world view, according to Candy, suggests a shift in perspective "from viewing knowledge as something external to be mastered, to an internal construction or an attempt to impose meaning and significance on events and ideas" (p. 251). Such a view supports three knowledge claims: 1) learners actively participate in the construction of knowledge; 2) construction

of knowledge varies according to each individual's prior knowledge and experiences; and, 3) students learn by creating for themselves representational models of reality that become guides to their actions (von Glasersfeld, 1989).

According to von Glasersfeld, the constructivist world view has implications for the development of individual student differences. A similar principle for the accommodation of individual differences, is embedded within an MI perspective. As discussed in the theoretic framework of this study, MI Theory addresses individual student differences through the principle that students learn, represent, and utilize knowledge in at least seven ways.

3.2 Context of the Study

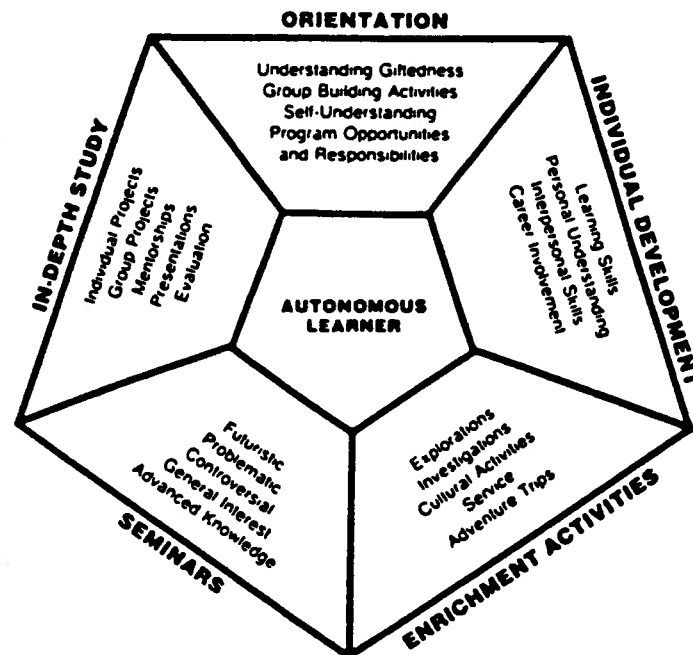
The public high school site, for gifted students in grades 8 through 12 was selected partly for its philosophy, and partly for its commitment to the seven obligations listed below. This school was particularly appropriate, because of its concern for the integration of subject specific courses. Students who apply to the school are assessed on a number of measures suggested by the Vancouver School Board Identification Guidelines for Gifted Education. Before acceptance, all students are personally interviewed. The students, however, are not chosen on the basis of academic excellence only. The school's philosophy states that eligible students will be capable of high performance and include those who have demonstrated any of the following abilities, singly or in combination: 1) general intellectual ability; 2) specific academic aptitude; 3) creative or productive thinking; 4) leadership ability; and, 5) visual and performing arts aptitude.

The school, on the other hand, has stated in their philosophy that they are committed to:

- Allow students to be grouped with their intellectual peers.
- Provide challenging educational activities and preparation for post-secondary education.
- Develop higher order thinking and creativity.
- Develop group and leadership skills.
- Assist students to clarify values.
- Encourage the pursuit of individual educational interests in depth.
- Provide opportunities for positive community involvement.

The school's commitment to the Autonomous Learner Model, (Betts, 1985) provides another reason for the suitability of the site. Students who attend this gifted program were already well acquainted with the notion of individual development, and would therefore be able to identify the components that enhance, or obstruct individual development. Figure 3.1 is an illustration of the Betts' Autonomous Learner model. It has been the primary model of the development of student autonomy used in the school for addressing gifted students' potential.

After the first few months of working with the teachers on the development of the integrated units, of informally visiting some classrooms and chatting informally with many students, the head teacher assigned me eight student volunteers from grade ten. I had requested four boys and four girls, and asked that they represent a variety of abilities, rather than the traditionally emphasized verbal and logical-mathematic abilities. These



students were introduced in Chapter 1, and their perceived interests and abilities were listed in Figure 1.1.

3.2.1 Gaining Access

A letter explaining the intents and purposes of the study was sent to the Vancouver School Board. After approval was received from the School Board, letters were sent to the principals of 3 high schools. Within one week, one principal responded, and invited me to the school site. Following a meeting with 4 teachers at the high school, I proposed to work with teachers in assisting them to implement MI Theory in their classroom practice.

See Appendix E, for a copy of the letter of permission granting access to the site, received from the Board of School Trustees of School District No. 39 (Vancouver), on November 4. Verbal consent previously granted by the student assessment and research

branch of the Vancouver School Board enabled the study to begin in mid September, after an initial request from the high school's head teacher.

While my specific role was unclear initially, we agreed that I would participate in a collaborative effort with four teachers and eight students at the high school's subsequent staff meeting. At that meeting, in mid-September, I introduced MI Theory and invited the teachers to submit questions concerning the theory as it might be applied to their curricular and instructional concerns. These questions were later classified (see appendix A) and they served as a guide for me to assess the effectiveness of our endeavours to use MI theory to enhance the integrated curriculum approach, currently used at the high school.

3.2.2 Subject Areas Represented

Four teachers worked together on the project. For one month, students worked on a project that was graded for 10% of each of four subject areas, mathematics, science, social studies, and English. Simply put, students completed the projects and received a grade of up to 10% in each core subject for their work. In Chapter 5 student projects are discussed, with illustrations provided to demonstrate how each student described the project work. Finally, the projects were examined to determine if the students' perceived abilities were expressed in their projects.

3.2.3 Sources of Data

There were two primary sources of data in this study: individual and group interviews from the eight participating students and the four teachers held over a period of approximately eight months; and a narrative journal that I kept throughout the course

of the study. This journal documented the numerous meetings (both organized and informal), classroom visits, and the many informal discussions held with both the students and the teachers over the course of the study. A visual timeline for this process is located in Appendix I.

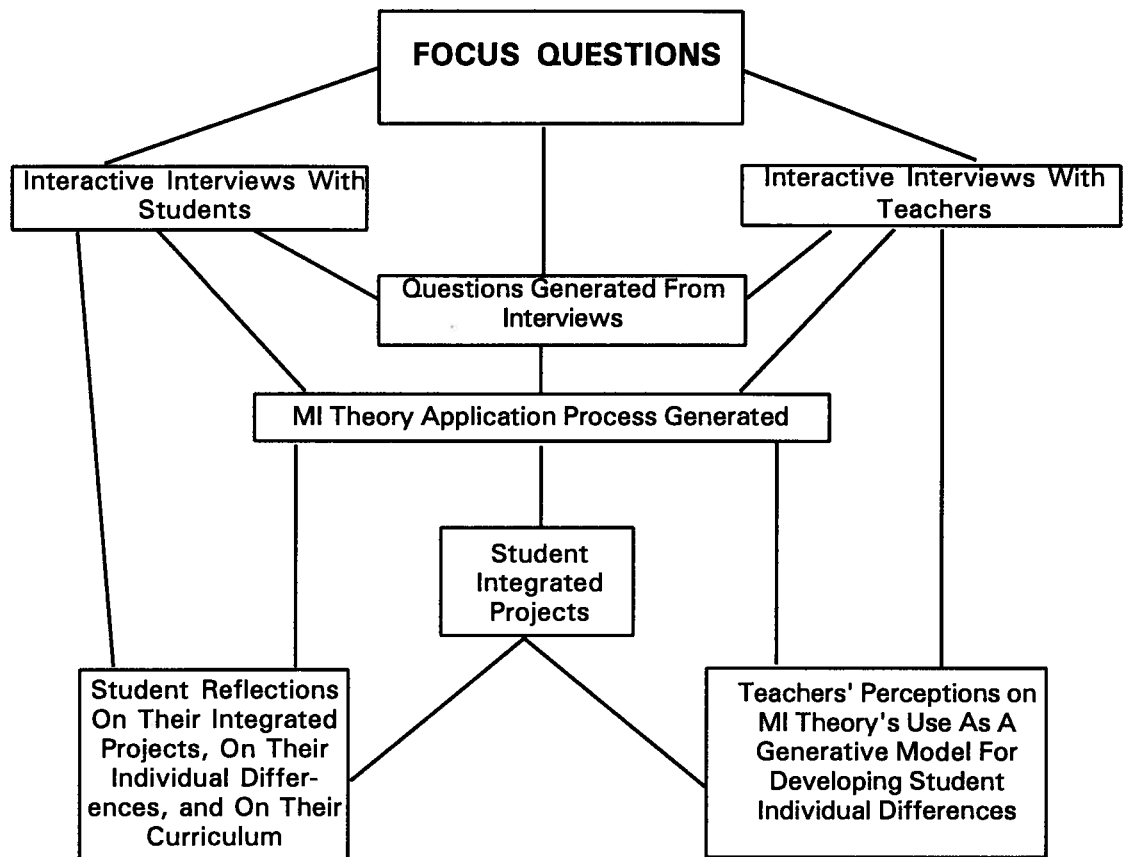
3.3 Data Analysis

This section discusses the data analysis, and outlines the various organizing schemes used. As illustrated in the previous section, interactive interviews generated the narrative data used in the study. That is, a collection of ideas and stories were related by students and teachers concerning student differences and curriculum's capacity to address these differences.

As discussed earlier, there was a strong interaction between the focus questions guiding the study and the methods of data collection and analysis. The nature of this process of question framing and data analysis will be presented below. This will be followed by a section on the procedures used for data reduction in the study in an effort to "extract the most important features of the phenomenon under study and explicate the patterns that are discovered" (Tesch, 1987, p. 6).

3.3.1 Question Framing and Data Analysis

In Figure 3.2 I have attempted to represent the way in which the data obtained from the students and the teachers were central to the selection of the methods of data collection and analysis used in the study. The primary intent of this Figure is to represent the interactive nature of the data collection methods and how they influenced the development of the MITA model and the final framing of the focus questions for the study.

Figure 3.2 MITA Model Development and Implementation

As illustrated in Figure 3.2, the MITA Model development and implementation was directly influenced by several players: the researcher provided the initial focus questions, the students provided ideas and generated new questions, and the teachers provided ideas and generated questions. Indirectly, parents ideas were also included through the students contributions concerning parents' ideas.

My focus question initially evolved from: *How does Howard Gardner's MI Theory impact on the notion of using interdisciplinary methods in high school teaching?* to ask: *How do high school students and teachers in their classroom practices, use multiple intelligence ideas in order to address individual student differences, within the traditional constraints of a high school?* The original question was based on my work with the teachers in order to implement MI Theory. The reframed question, however, focussed more upon the perceived impact of the program upon the students and the extent to which their interests and abilities were being met. This question was addressed through in-depth conversations with students, and through documenting students' and teachers' perceptions of the development of the students' individual differences during this program. Rather than concentrate on the role of MI Theory as a generative model for high school curricular organization, I decided to emphasize the role of students' perceptions of themselves and their curriculum.

3.3.2 Data Reduction Issues

The method of analysis that I used was designed to extract "essential features" from large amounts of text through an organizing scheme which consists of a process of "classification" (Tesch, 1987). This process consists of three broad phases: a holistic reading, a discerning of patterns, and an interpretation of themes. This classification

process allows a distinction to be made between various "segments" of text. "Segment" here refers to that portion of text that relates to a significant issue. With each text segment, Tesch (1987) suggests, the researcher should decide where the person started talking about the particular issue in focus. Where does she stop talking about the issue?

So the researcher must determine where to begin and where to end each segment. The text's segments in the study are classified according to their ability to meet a set criteria, such as a particular focus question. That is, a given segment is sorted into a particular slot, through a classification scheme that uses set criteria for each text segment.

Audio tapes of each interview were transcribed, and then marked into text segments, for a detailed analysis of text. These segments were examined for words or key phrases that described the students' perceptions. Each example of interview text is referenced according to its exact context within the interviews. This type of text inquiry followed the constant comparative method outlined in Glaser and Strauss (1967) and used the procedures presented in Miles and Huberman (1984).

Using classification procedures in this way resulted in an analysis where the categories are generated during the analysis rather than using a pre-determined classification scheme to sort the data as is common in a natural science approach. To illustrate this distinction Tesch (1987) notes that:

One major difference between natural scientists and researchers who do text analysis is that the natural scientist usually considers the classification scheme the result of her research; some classification schemes, such as the table of chemical elements or the botanical taxonomies, count among natural science's most brilliant achievements. In contrast,

when analyzing her data, the qualitative researcher uses classification predominantly as a tool (p. 5).

However, the methods of analysis cannot merely consist of a random division of text or transcript data into smaller units. Instead there must be a method to the process that is systematic and goal-oriented (Tesch, 1989). This process is designed systematically in order to lead others to a logical set of results that clearly represents the data. She describes the process in this way:

. . . the process of analysis is, in fact, a representation in the same sense that an artist can, with a few strokes of the pen, create an image of a face that we would recognize if we saw the original in a crowd. The details are lacking, but a good "reduction" not only selects and emphasizes the essential features, it retains the vividness of the personality in the rendition of the face. In the same way a successful qualitative data reduction, while removing us from the freshness of the original, presents us instead with an image that we can grasp as the "essence", where we otherwise would have been flooded with detail and left with hardly a perception of the phenomenon at all (Tesch, 1987, p. 3).

While it is true that no two researchers would produce exactly the same rendition of one face in a crowd, it is also true that if the process is skillfully designed, we will, nevertheless, recognize the same person in various renditions. Qualitative research does not demand that researchers produce the same results (Hammersley & Atkinson, 1983).

Researchers will differ in philosophical stances and individual styles of interviewing, observing, interpreting, and recording. In qualitative research, these differences are expected to lead to different ways of representing the results (McMillan & Schumacher, 1989).

My endeavours to construct "the essence" from the interview data involved the following procedures. First, I transcribed all the interviews (and provided copies of these transcripts to each participant to check for accuracy), then I read through the entire data several times and extracted the most important features of the questions asked, and finally, I made notes on issues or themes that appeared to be reoccurring in the data.

According to Hammersley & Atkinson (1983), one common difficulty faced by researchers in qualitative designs, is "how to translate the knowledge and descriptions of a given culture into a serial order while simultaneously imposing some sort of analytic and thematic order upon material" (p. 221). Put simply, *one separates the data collected and the cultural description from the analysis*. In such a separated text one can present an "engaging and accessible account of the data, relatively unencumbered" (Hammersley & Atkinson, 1983). Once the data have been reported, the researcher may discuss themes and problems without further entanglements of the data themselves. To do this, the ideas of each student are examined in this manner; first their comments are reported, and then the analysis of these comments, for the purpose of locating themes or patterns. The themes or patterns are gradually framed through comparisons made from each student's response. Finally, students' responses were compared to teachers' expressed ideas on each common topic. This method of separating student comments from data analysis can lead to problematic links between the data and thematic frameworks. According to Hammersley & Atkinson (1983) such a separation may even appear to

imply that the student comments are somewhat innocent or pre-analytic. Nevertheless, by illustrating the student responses and comparing the relationships in this manner the desired distinctions between students and teachers should be more apparent.

3.3.3 Researcher's Intentions and Roles

As discussed previously, my intention was to remain an active participant in the research process. My goal was to understand how both the teachers and students were perceiving the curricular changes that were occurring, to summarize or highlight their contributions, and at times provide new ideas to the curriculum development process. I redefined my role as the work progressed, taking into account the current focus of the project, what each of us would provide, and what goals I hoped to achieve for the study. At times my role became blurred, as did the teachers' and even the students' participation. Clearly, one well-defined role I maintained was to provide ideas and materials that related the MITA Model to the school's expressed objectives. For example, I mapped ideas for the grade 9 lesson on Power onto the MI Theory of learning, as well as provided sample bulletin board illustrations for MI Theory introduction to the classes (see Appendix G). In addition, I provided a comprehensive list of alternative instructional techniques and evaluation techniques (Appendix H) that could be used with the MI ideas previously agreed upon. In these instances my role was to provide busy teachers with as many practical applications of our discussions as possible, in order to facilitate their implementation of the MITA Model.

In order to avoid any possible conflicts in our respective interests, I continually attempted to define the broad aims of the research, as I understood them at the time. For example, I circulated a suggested focus for each meeting for the teacher's perusal

before the next meeting, and I listed my research agenda clearly in a memo provided for the teachers at the November 22nd meeting. This material is included in Appendix F. I asked teachers to share their instructional goals in the earlier meetings. These goals were refocused and discussed in subsequent meetings. It was not surprising that my own goals were more clearly defined, since I was working within the tight framework of a doctoral dissertation. The teachers' goals appeared to be less clearly defined. I attribute this observation to three reasons:

1. Teachers were unsure of what the project would contribute to the school in general. Furthermore, they had been exposed previously to other models of learning, which had a somewhat different focus on the teaching-learning relationship.
2. The very task of high school teaching is demanding of time, energy, and commitment, and the teachers were unsure they would experience sufficient benefits for the time expended
3. Teachers were not unified in the changes they wished to make in the school, and so at times our discussions were long and occasionally heated. The negotiation to reach common understandings and purposes was a long and sometimes difficult process.

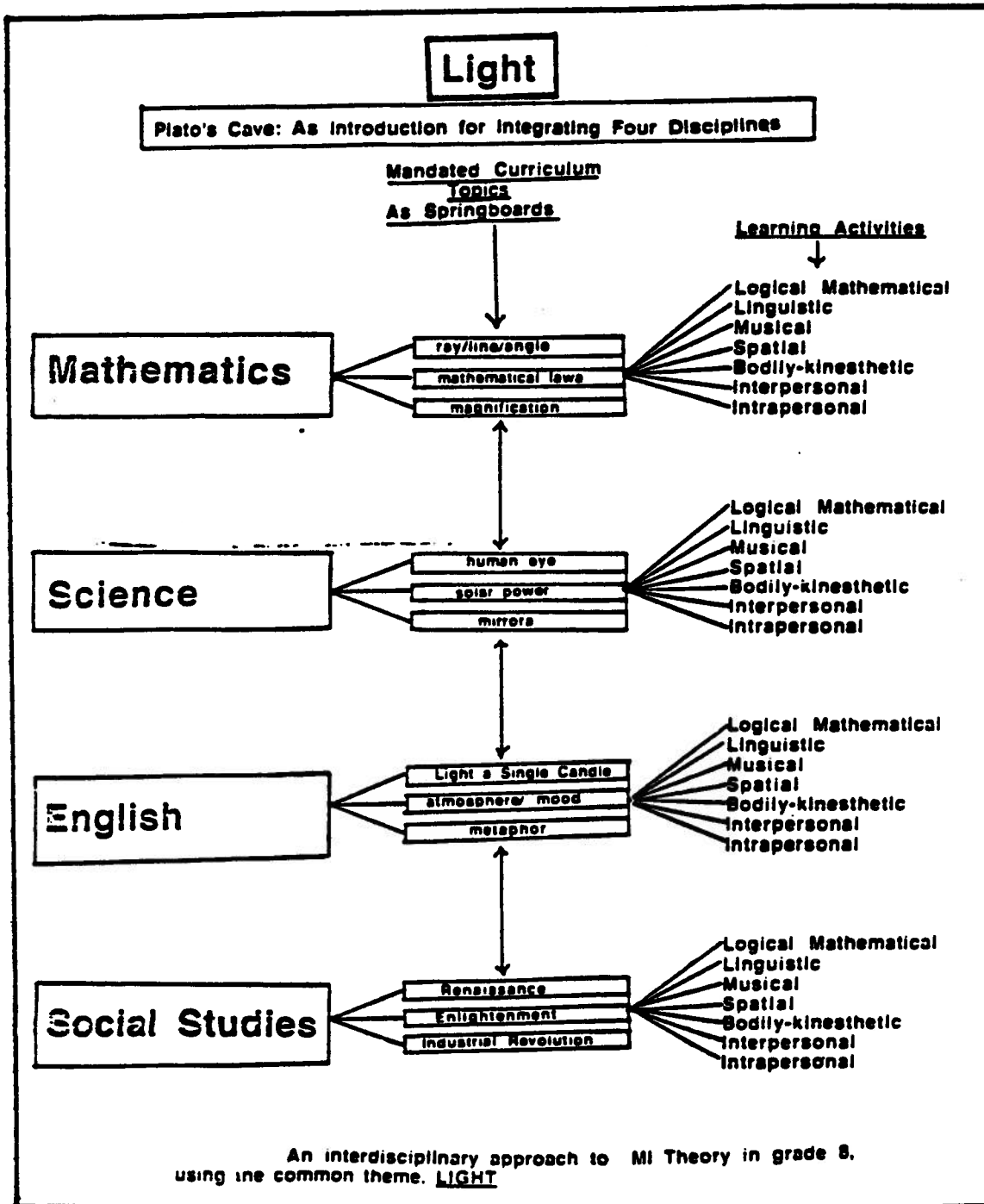
It appeared at times, as though we occasionally remained suspended between the desires to integrate and change, hence we sometimes experienced an impasse concerning the manifestations of that change. Part of that frustration, as has been earlier discussed, may be the result of frustrations one encounters whenever change takes place. Fullan (1990), for instance, argues that change is a difficult process, and not merely an event.

We did, however, agree on a number of important issues. For example, we agreed that each student is unique, and vastly different from one another. We also agreed that too many teens feel defeated or drop out of high school because they are not treated as individuals. But when we addressed the question of *how to cover mandated curriculum and still encourage* the students' differences, we discovered the solutions were less clear. The directives came from the group, at different phases of the collaborative process. One teacher on our collaborative team, for example, refocused our ideas away from the way high schools traditionally operate, when he suggested that we relocate the role of mandated curriculum from its current place as *end product* to the new position of *springboard*. That led to a discussion about possible springboard ideas into deeper understandings, and we agreed to try to create an integrated curriculum, using one theme for each grade, with mandated curriculum as springboards.

Figure 3.4 illustrates our collaborated outline for a grade 8 unit on the common theme of "LIGHT". The mandated curriculum, in this diagram is relocated to the position of "springboard" and the learning activities are intended to activate the students' individual ways of knowing.

As critical questions emerged and we attempted to create shared solutions, my position as researcher on this vibrant team, profoundly changed my understanding of both the role of researcher and the role of teacher, in making positive change. In fact, questions and answers exchanged between school and university members with equal intensity as we began to speak a language that both understood. Each of us brought different notions of how to proceed. At first we seemed to make very little progress, but after about 30 hours of meetings I constructed *an integrated model*, in order to illustrate the approach that we agreed upon. After much debate on how we might best dissolve

Figure 3.4



our barriers in order to integrate mathematics, science, English, and social studies, we came up with the basic integration design illustrated in Figure 3.4. Our common themes, *light* for grade 8, *power* for grade 9 and *change* for 10, would give each of us a starting point to go back to our core curriculum and select three relevant topic areas. Each of these topic areas for Light are listed in Figure 3.4 under the title *springboards*.

In order to create a design that would work, we first had to identify how secondary teachers make sense of Multiple Intelligence ideas in their classroom planning, given the traditional constraints of a high school. Five basic new commitments were agreed upon. These five include: (1) people use at least seven relatively autonomous intellectual capacities, which shifted our focus from asking: *How smart are you?* to ask *how are you smart?*; (2) since intelligences are unique and individual to each student, our high school curriculum would shift from memorizing facts to using content as a springboard in order to address these student ability differences; (3) assessment would become more performance-based to accompany more conventional paper-and-pencil test; (4) instructional units would shift from teacher-centered and disconnected curriculum toward an integrated or thematic approach, which builds on individual students' prior knowledge in each subject taught; (5) since we all belong to a community of life-long learners we would look for ways to collaborate with one another, and so benefit together in the learning process.

3.3.4 An Organizing Scheme

The organizing scheme described in this section, was used to identify themes and significant issues in the data. Words, by themselves, or taken out of context, according to Tesch (1987), are useless. Tesch suggests instead, that one must look for a linear

arrangement of meanings, through a classification and reporting process. It goes without saying that this presents certain difficulties, particularly in the development of an organizing scheme. According to Hammersley & Atkinson (1990), difficulty arises because: "The everyday life under investigation is not itself organized in such a neat linear array". They further suggest that: "Presentation of aspects of it in this way is something that many people find particularly difficult" (p. 212).

One difficulty, for me, arose from the fact that frequently as I read through the interviews, I had to fight the impulse to record essential gems of each story told. Hammersley & Atkinson (1990) describe this difficulty as wanting to "write everything first". The likely cause of the "everything first" dilemma, is the desire to acquaint the reader with every possible aspect of the relevant setting. I developed several heuristics to assist me in addressing these sorts of difficulties.

One heuristic developed to counteract the "everything first" dilemma included the development of a carefully constructed data organization scheme whereby I read an entire section of transcript data several times, and then used the five key questions about curriculum as a basis for sorting the data. Each of these questions was derived from the literature. For example, the first question related to time and the development of individual differences. Brown, (1991) also identified time as the most significant barrier to development of student individual differences.

The second heuristic used, was one of attempting to create some distance between one's immediate impressions of the data and a longer term, more holistic analysis. Following the interviews and meetings with students and teachers, many of the details seemed to demand expression on every page I wrote. Only as I pulled back from

the specific ideas and concepts, and tried to see them as a whole, could I begin to see some recurrent themes and patterns.

More specifically, I developed a type of organizing analytical scheme that consisted of four functions. These I describe as: housekeeping functions; identification functions; coding functions; and, reporting functions. In the following sections, I describe each of the four functions as they guided my analysis procedure.

3.3.4.1 Housekeeping Functions

The first function was to create files on every student, make sure each participant had seen copies of their interview transcripts to check them for accuracy, and ensure that copies of all data files were maintained. Once I decided on a suitable system for coding, colored cards were purchased, so that each of the five questions addressed by the students could be tagged within the interview files. These files were then printed, and hard copies were prepared and numbered as protocols.

3.3.4.2 Identification Functions

As discussed previously, the students responded to the five questions focussed on time, space, authority, subject matter, and people, as these issues are related to both students' individual differences and to their high school curriculum. Each of these five questions served to create one distinct classification, and so each one served to tag student responses. For example, responses to the first question, "How can we divide school time in order to include the students' passions for knowledge?", were tagged in yellow. The second question: "How can we cultivate an environment where friends are free to nurture and support one another?", was coded in pink. Question three, "How can

we increase student authority in order to promote independent learners?" was coded in grey. Question four, "How can schools be more connected to the students' passions and the real world of today?" was coded in green. Finally, question five, "How can we encourage parental involvement in more curricular issues?" was color coded in blue.

3.3.4.3 Coding Functions

Rather than concentrate on single words or phrases in the data, I began the analysis with several overall readings of the entire data, in order to determine their holistic meaning. There was a certain automatic coding system which emerged, given the fact that interviews were organized around these five topics of curriculum organization. Following the color coding to distinguish the students' and teachers' responses, searches were made for what Tesch refers to as "co-occurring codes" (segments to which more than one code was attached) and noted each with a separate marker. In this way, "other" important data emerged.

3.3.4.4 Reporting Functions

In order to select the most representative data to report, one must consider the process of this type of qualitative analysis, where the researcher begins with the relevant text segments and organizes them according to their content. The organizing scheme used here developed gradually, as the analysis proceeded. After sorting, and extracting segments, or "categories" I tried to discover what Tesch terms, "the regularities and uniqueness within this category", including all the nuances. Each of the regularities, I termed "a theme", which I then used to provide a narrative account. The purpose of this

account or "report" is to illuminate the phenomenon and develop deeper insights from the analyzed data.

Following each session with the teachers, I documented a summation of their comments on each topic discussed. Furthermore, I formulated critical questions that were discussed directly, or that emerged from the discussions. The data summaries were routinely faxed back to the school within days of each session, for further ideas and member checking. In addition, I frequently translated theoretic ideas that we explored at meetings, into practical charts that we could use for classroom implementation. The ideas, for example, were represented on flow charts or diagrams, and provided for teachers' personal classroom use. Several samples of such feedback papers faxed to teachers are included in Appendix F. For the purpose of anonymity, all names and titles have been deleted.

3.4 Questions of Validity and Reliability

While qualitative research is being increasingly used in studies of educational experience (Connelly & Clandinin, 1990), there are also increasing questions regarding the validity of qualitative methods and the justification of knowledge claims. For the very components of the qualitative design that render this research attractive for describing and "getting at" motivations, values, experiences, and activities, also make validity and reliability difficult to describe at times.

As previously discussed, a coding procedure recommended by Glaser (1965) and Strauss (1967) was used to assist in the initial identification and highlighting of themes. Once coded a protocol is "brainstormed" in order to identify dominant categories of

questions to pursue. The following questions, for example, were used to organize/analyze the student data:

1. Which high school disciplines were most commonly mentioned by students as those enjoyed?
2. What exactly did students suggest were the benefits of high school, in their view?
3. Were there connections between student passions and high school learning opportunities?
4. Were students opposed at times to assignments they were told to complete? Why or why not?
5. What characteristics raised students enthusiasm for high school?
6. How did students express negative reactions regarding their curriculum?

In addition to the individual "conversations," further validation of the student perspectives were sought through group interviews involving several subjects. Group discussions were held between different participants, along with the in-depth interviews conducted between the researcher and each participant. These "discussions" are not easily designed, and are perhaps selected and reshaped according to significant choices made throughout the entire collaborative process.

One form of research validation developed by Eisner (1977), *educational criticism and connoisseurship*, draws its image more from the arts than from science. Educational connoisseurship, according to Eisner, is the art of appreciating the educationally significant, while *criticism* in such research makes public the perceived issues through description, interpretation, and assessment (Eisner, 1985). In place of a more traditional

account of validity, Eisner refers to *referential adequacy and structural corroboration* (Eisner, 1985, p. 241 - 245). Referential adequacy involves checking to see if critical observations and interpretations are empirically grounded, allowing readers to experience the evaluated phenomenon in a new and better way. Structural corroboration refers to a continuous inquiry about whether the various parts of the criticism fit together as a consistent whole. Just as one might understand more of the significance of the lives of the poor Londoners from reading a Dickens' novel than reading a statistical account of the same period, educators who read educational criticism will be moved to different insights than those who read quantitative educational research papers.

3.4.1 Issues of Methods

My main goal in the development of the interview questions was to ensure that they were highly interactive and that they provided an opportunity to highlight the students' and teachers' stories. A second goal of the interviews was to discover each participants' notion of the curriculum as it was experienced in the classroom. To structure the discussions about this latter issue, I divided the questions about curriculum into five main components that appeared to be addressed most frequently in the literature: **time, space, authority, subject matter, and people**. A complete list of the questions that guided the first set of interviews is listed in Appendix B.

Times and places for interviews varied, in order to enable participants to fit these sessions into their busy schedules. For this reason, most of the teacher interviews took place at the school, some at the university, and a few were taped over the phone, in order to accommodate the schedules of all participants. I interviewed and taped all conversations, but they were initially transcribed by an independent party. Each interview

protocol was then typed from the rough transcription notes, by myself, a process which assisted me to actively engage in the recorded communications from the earliest stages of the project.

Narrative forms in research have often drawn upon McMillan and Schumacher's (1989) method of using a field journal to record and analyze relationships, and in so doing, connect theory and practice such that we learn more about the nature of the theory as well as about the practice. The narrative in such a journal attempts to create a common language between the participants, and thereby endeavours to create a shared community for those in the university and those in the schools. Within this community, our relationships with one another and our knowledge of the practice setting are expanded (Lieberman, 1992). The field journal provided both *substantive* and *analytic* field notes, a record of teachers' stories, students' stories, and stories from the researcher. According to McMillan and Schumacher, all methods (or "instruments" as they call them) used in a qualitative study should be subjected to a series of 4 questions:

1. Are the instruments valid and reliable for the particular research?
2. Are the characteristics of the subjects used to establish validity and reliability similar to the characteristics of the subjects in the study? If not, is it reasonable to use the instruments?
3. Why did the researcher choose these instruments?
4. Are the instruments described well enough or referenced to allow another researcher to replicate the research? (p. 169)

In response to the first question, one method of establishing the validity of qualitative methods is to argue that the questions and situations used are clearly

understood by the participants and that they generate reliable data relevant to the research questions of the study. In the present study I have attempted to ensure clarity and understanding in the interview process through the use of open-ended questions that allowed the participants to explore the issues that I raised as well as to identify concerns and problems of their own.

While these types of open-ended interviews are structured, in part, by both the researcher and the participant (Wolcott, 1990) the researcher must continue to focus the discussion in order to respond to the research question. While an interview for qualitative research reporting is less structured, in that both researcher and informant are active participants, nevertheless, questions which guide the "conversation" must be tightly focused in order to avoid vague or omitted details from the participant. That is not to suggest that rigid or even directive questions must guide the discussion. In fact non-directive questions are often an effective measure of inviting a participant to discuss issues and contexts related to the question, that were hitherto unknown and unexpected by the researcher. Several examples of such non-directive questions used with the students regarding their individual differences are given below:

Researcher: . . . I am trying to discover what makes your high school program fit your own individual uniqueness. Would it be best for you to begin telling me about your particular interests and abilities, and how these are addressed in high school math or social studies . . . ?

Researcher: That is interesting. Do you mean that you are presented opportunities to act out your own ideas in this English class?

Researcher: I would like to have seen that. Can you think of other classes where you felt that an activity was designed to fit your own abilities?

Such non-directive questioning induces the participant to describe and discuss key issues with more clarity and detail (Hammersley & Atkinson, 1990). When the research question and focus are clear in the interviewer's mind, the study is more certain to produce accurate information.

In response to the second question, pilot studies were conducted with 2 students who had just entered university and who had graduated in gifted programs from schools similar to the research site in this study. The interview questions were modified considerably following the pilot studies. Initially the questions were related to grade 11 social studies, exclusively. Following the pilot study, the questions were altered to include four disciplines (mathematics, English, social studies, and science) in grade 10. The change was partly due to the research setting where I carried out the actual study and partly due to the limitations of focussing exclusively on social studies in the pilot study. Students in the pilot study, for example, often referred to topics not related to social studies, and at times appeared restricted in their responses when only one discipline was involved. The modified questions allowed the participants to discuss a broader range of curriculum issues that relate to students' abilities and interests as they are developed in a wider variety of disciplines. I also piloted many of the questions used in the teacher interviews with other experienced teachers who were interested in similar issues of curriculum development.

In response to the third question, the particular methods were selected because they appeared to reflect the purpose of the research questions, to accommodate the participants involved, and to allow the flexibility required in order to generate the outcomes that would include students' and teachers' expressed ideas and experiences. The interview was chosen mainly with the student participants in mind. As previously

discussed students are frequently excluded from interactions concerning their curriculum (Fullan, 1982). One reason for such exclusion may be the traditional use of "jargon" or non-inclusive language, not familiar to students. Interactive interviews provide a natural starting point for students to express their perceptions. Students generally relate well to and enjoy telling stories (Coste, 1989). For this reason, interviews which encourage students to tell stories also provide opportunities for constructing student ideas, and facilitating records of student educational experience (Miles & Huberman, 1984).

In response to the fourth question, while the data collection and analysis methods have been described and details illustrated, it would not be possible for another researcher to replicate the results. While the process is systematic and goal-oriented, the nature of this study is such that we need to grasp the essence of students and teachers' notions in this particular context. There are no one set of canons and methods of qualitative analysis (Miles, & Huberman, 1984), and while no two qualitative researchers will arrive at exactly the same conclusions, we now have acquired a 20 year old history of design and conduct (Howe & Eisenhart, 1990).

In summary, the in-depth interviews in the study took place before and after MI Theory implementation, in order to identify differences in perceptions before and after the introduction of MI Theory. Participants were told the purpose for the interviews. For example, each student was informed that this discussion was designed to find out more about what they think about *the merits or disadvantages of the grade ten curriculum, and about the development of their individual differences*. The audio-taped transcriptions were coded, and filed into separate categories by the researcher. The students and teachers were assured that names would be changed in the report, as would the name

of their school. In addition, they were told the completed report would be made available to them.

3.4.2 Issues of Analysis

Following data collection, the data were interpreted for meaning, and themes or patterns identified. The authenticity of all data and the interpretations derived from the data was brought about by triangulation. Triangulation was accomplished through an analysis of school rationale statements, through student interviews, and through teacher interviews. It should be noted, that the purpose of triangulation was not simply to arrive at one objective reality. Triangulation facilitates, rather, a wider consideration of possible interpretations that could be made of the same phenomena (Denzin, 1989); Lincoln and Guba, (1985). Denzin (1989) points out that observer does not necessarily mean observer of the object, but can refer to observer of the data. In this case observation refers to more than one data collection method, as a guard against the possibility of excess bias. The intent was to compare the data gathered with developed conceptualizations, rather than to confirm or disconfirm the developing conceptualization.

According to Schumacher (1979), a multiple data approach, which includes: *multiple methods, multiple participants and multiple situations*, provides greater objectivity. This study adapted several components from each of Schumacher's categories. In the manner Schumacher describes, the *multiple methods* include: policy analysis; casual conversations; focused interviews; rationale documents; school's philosophy statements; and, extensive field notes. The *multiple participants* include: the school's head teacher, teachers of English, social studies, science and mathematics; students from the four core subjects; board program director; curriculum specialists, and

former students. The *multiple situations* include: planning meetings with thesis supervisor and each member of the thesis committee; participation in weekend conferences on Multiple Intelligence ideas, including one with Howard Gardner; and, Vancouver School Board conferences.

3.5 Issues of Generalizability

According to Firestone (1993) there are three broad arguments to make a case for generalizability of findings within qualitative research. The three arguments are: (a) extrapolation from sample to population, (b) analytic generalization or extrapolation using a theory, and (c) case-to-case translation. Of these three, this study can claim two arguments for generalizing, analytic generalization and case-to-case translation. The study claims analytic generalization as there are multiple links made between the participants and Multiple Intelligence Theory. Similarly, the study claims broader relevance through its case-to-case transfer, particularly for what Firestone terms, "rich, thick description" (p. 22). So while Firestone admits that "the argument for qualitative research has never been that its claims for generalizability are exceptionally strong" (p. 22), the study attempts to increase its broad applicability through describing the processes in one high school setting as well as the beliefs and perceptions of those within it. This issue is discussed at more length in Chapter 7.

3.6 Limitations of the Study

The delimitations of the study are (a) specificity of setting and (b) inability to evaluate formally the MITA Model. The limitation of the study is (c) interruption by a lengthy teacher strike. These limitations are manifested in problems of generalizability of

findings, and in a lack of opportunities to assess the MITA Model findings within regular classroom practice.

In order to increase confidence in the MITA Model findings, the model requires greater use and evaluation from within regular classroom settings. According to Miles and Huberman (1984), any single study generally provides only weak support for a knowledge claim and requires further replication studies to strengthen that claim. In this case, it is difficult to show that the MITA model findings hold broadly across a wide variety of high school classrooms. To do so would require further evaluation of the model in a variety of settings.

Accordingly, the same limitations to replicability also pose threats to the external validity. If a curriculum coordinator is using the MITA model, for example, to provide a criterion for program evaluation in a large high school district, the teachers may conclude the MITA model program failed because it works only with certain groups of students, or in specific circumstances. Lastly, because of a strike, near the conclusion of the study, I was unable to discuss the model's use in further detail after its application. Since the two week strike came near the end of the school year, both teachers and students were faced with extra pressures to meet deadlines before the summer break. Both the timing and length of the strike, prevented further discussions with students and teachers, as well as a more detailed evaluation of the MITA model.

CHAPTER 4: THE DEVELOPMENT OF THE MITA MODEL

4.1 Introduction

Chapter 4 describes the MI Theory Application (MITA) Model, one of the major contributions of the study, and discusses the model's development. The MITA Model is used throughout the study as a framework through which to examine Multiple Intelligence Theory as a tool to address student individual differences. First, the origins of the model are discussed; second, the processes involved in developing the model are examined; and third, the ten implementation stages of the model are listed and discussed.

4.2 Origins of the MI Theory Application (MITA) Model

Over a period of one year, with suggestions from participating students and teachers, I developed the MITA Model, as a tool to introduce MI theory to students and teachers for their consideration in high school learning. Similar to Eisner's (1993) criteria, the MITA model combines as inseparable, notions of learning and assessment. The model consists of a ten-phase heuristic for using MI Theory in classrooms to address individual differences. Students' descriptions of their individual differences, and of their curriculum, were considered during each stage of development. Although I did not discuss specifically the MITA Model with the students, I did discuss with them some of the basic ideas concerning multiple intelligences.

While the MITA Model reflects my discussions with students and teachers, it should be noted here that the actual construction of this model comes from my own interpretations and summaries of those discussions. The model was, shared with the four

teacher participants at several stages of its development. In the sense that Tesch (1991) notes that research findings are really the researcher's story, not the participants', this model is based on my own understandings of MI theory as a useful tool in planning experiences for high school learning. This understanding is influenced by my own philosophical assumptions, theoretical views, experience, education, and discipline, which are not necessarily shared by all eight students or four teachers. Unfortunately, a teachers' strike, during the study's final stages, prevented further discussions about their perceptions of the model's overall usefulness

4.3 Multiple Intelligence Theory Application Model: An Overview

The MITA model, shown in Figure 4.1, is presented in ten phases which were involved in introducing MI Theory into the high school setting used in this study. The model was generated in response to the question: "What is the nature of the curriculum development process when high school students and teachers in their classroom practices, apply ideas congruent with Multiple Intelligence Theory, in order to address individual student differences, within the traditional constraints of a high school? How can these processes be incorporated into a model?" It includes:

- 1) *Collaborating among teachers***
- 2) *Brainstorming with students***
- 3) *Introducing MI Theory to students***
- 4) *Completing interest inventories***
- 5) *Linking mandated curriculum***
- 6) *Inviting parents' ideas***
- 7) *Consulting with each student***

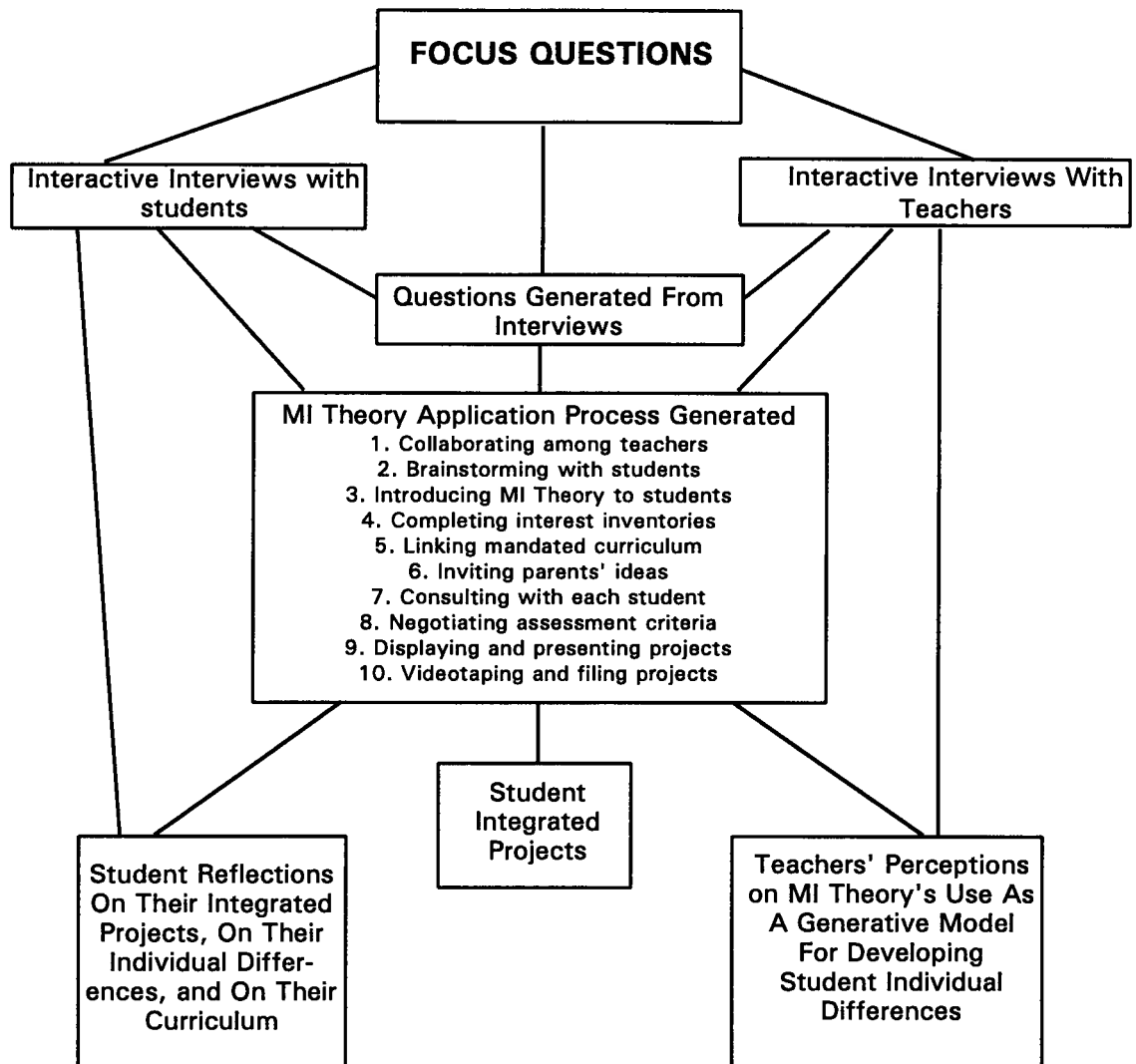
- 8) *Negotiating assessment criteria***
- 9) *Displaying and presenting projects***
- 10) *Videotaping and filing projects***

A description of each stage, with illustrations provided where possible, is described in the remainder of the chapter. Figure 4.1 represents the most important components involved in the development of this model, and illustrates the interaction between the participating students, the teachers and myself. The representation is NOT, however, meant to convey a formula for applying MI Theory in all situations.

4.3.1 Collaborating Among Teachers

The first phase involved a collaboration among teachers, myself and, occasionally, my thesis supervisor, who met at the high school to plan the integrated curriculum design. Eisner (1993) argues: ". . . tasks should require students to display sensitivity to configurations or wholes, not simply to discrete elements." From the initial stages of each new unit, our team discovered that we could learn a great deal from one another. Our original mandate was to brainstorm for ideas in order to construct the units around a common theme. We attempted to include learning activities which invited students to learn the materials in a multitude of ways. The themes chosen were the following: Grade 8 - Light; Grade 9 - Power; and, Grade 10 - Change. These collaborative meetings were not aimed at initiating changes in this setting, but rather to introduce MI Theory as a useful response to the change already in progress at the high school. For over two years, prior to this study, the school's four main teachers collaborated regularly in an effort to design an integrated curriculum that would both encourage more students to actively

Figure 4.1 MITA Model Development and Implementation (Expanded version) 95



participate in the curriculum, and increase student motivation to learn, through making connections across the four disciplines, english, social studies, science and mathematics. As this team of teachers worked together to try and dissolve some aspects of their subject disciplinary boundaries, some teachers recognized the need to change their existing curricular models. One member of the team explained that in order to introduce new curriculum designs that worked, they had to let go of old models, such as rigid barriers between disciplines, and think more in terms of interconnections.

4.3.2 Brainstorming With Students

In the second phase teachers drew upon their initial ideas and made connections with students. Fullan (1982) in, *The Meaning of Change*, claims that we almost never invite high school students to provide their own ideas in developing the curriculum they are expected to study. In fact, Fullan argues that teachers know almost nothing about what their students think. This study addressed this lack of student participation by actively involving students in the curriculum development process. We provided key opportunities for them to construct new knowledge, through building bridges from what they already knew to what they would learn. We provided opportunity for deeper understanding, and stimulated curiosity, through a process Jacobs (1991) describes as - moving from what they already know to learn new knowledge (Jacobs, 1991). This collaboration also increased communications between the students and teachers, so that both became partners in the planning stages. According to Fowler (1990), students should brainstorm more with teachers about the themes of each new unit in order to share their understandings and make recommendations. Through such an exchange, it

was felt that the students became an integral part of the lessons from their inception - an activity which increased their motivation to learn more about the topics discussed.

Finally, through a lively discussion where questions were raised, students were able to explore different ideas as to how they might activate their learning abilities to respond to their own inquiries. What unique abilities could each student use, for example, in order to express a deep understanding of each topic introduced in class? Which of their abilities might combine to solve problems or create a new product in each discipline? These questions led into the next development phase, *the introduction of MI Theory* to students.

4.3.3 Introducing MI Theory to Students

In order to assist students to examine their different intelligences, an interest inventory, shown in Figure 4.2, was designed to enable students to reflect on their own individual abilities and interests. Students were asked to identify their own abilities, and to outline any perceived weaknesses. In the discussion which followed, students expressed an awareness of their different interests and abilities; they considered how they might use their abilities and further develop their weaker ones. According to Gardner (1991), intelligences are always expressed in the context of specific tasks, domains and disciplines. Thus one strategy that teachers could use is to ask students to suggest activities which would be associated with each of the seven intelligences. For example, they may suggest experts who are proficient in one or more of the seven ways of knowing be invited to address the class. Experts who represent different ways of knowing, can suggest ways that a student can, as Eisner (1993) argues, "select a form of representation he or she chooses to use to display what has been learned" (p. 231).

Figure 4.2: Interest Inventory for Student Use

Name: _____

Interdisciplinary Unit: _____

1. Three words that describe me are _____

2. Things I like to do when I am not in school are _____

3. The subject I do best in school is _____

4. I would like to learn more about _____

5. Someday I would like to _____

6. Learning is fun when _____

7. If I could do anything I want to at school, it would be _____

8. I like to get praise for _____

Figure 4.2 Continued

9. At school, when I've done something well, I like to be acknowledged by _____

10. I wonder a lot about _____

11. I like people who _____

12. Sometimes I worry about _____

13. I learn best when _____

14. One thing that really bothers me is _____

15. Something that really challenges me is _____

16. One thing I know about myself is _____

(p. 143)

The following section explores the use of an interest inventory, developed by Campbell and Dickinson (1992, p. 143) to identify representations the students may select.

4.3.4 Completing Interest Inventories

Based upon the class discussions and questions raised about the unit topic, students responded to an interest inventory. According to Campbell and Dickinson (1990) the interest inventory (see Figure 4.2) provides students with an opportunity to express their understandings of their abilities and interests. Students discussed each inventory item in small groups in order to verbalize their notions of their individual differences and to get further insights from their peers about how these differences related to the unit being taught.

This interest inventory is also one tool for teachers to record progress from unit to unit, and can be adapted to relate to each unit taught. The interest inventories, if dated and filed, can be used to provide information concerning some aspects of the students' progress. Clearly, the inventory provides one method of getting to know students better, by providing an opportunity for them to express their ideas. In this way, students can be guided toward project topics that reflect their personal proclivities, and can be assisted in expressing their understanding of each unit learned. Students who respond thoughtfully to interest inventories will also gain greater intrapersonal awareness of their own abilities and goals (Dickinson, Campbell, 1991).

4.3.5 Linking Mandated Curriculum

Teachers on our team expressed concern that the mandated high school curriculum be covered without extra work for students, and that students not be disadvantaged by a thematic or integrated approach. How can students cover the required curriculum, and yet not be bound by it? Eisner (1993) argues: "tasks should have curricular relevance, but not be limited to the curriculum as taught" (p. 230). One teacher suggested that mandated

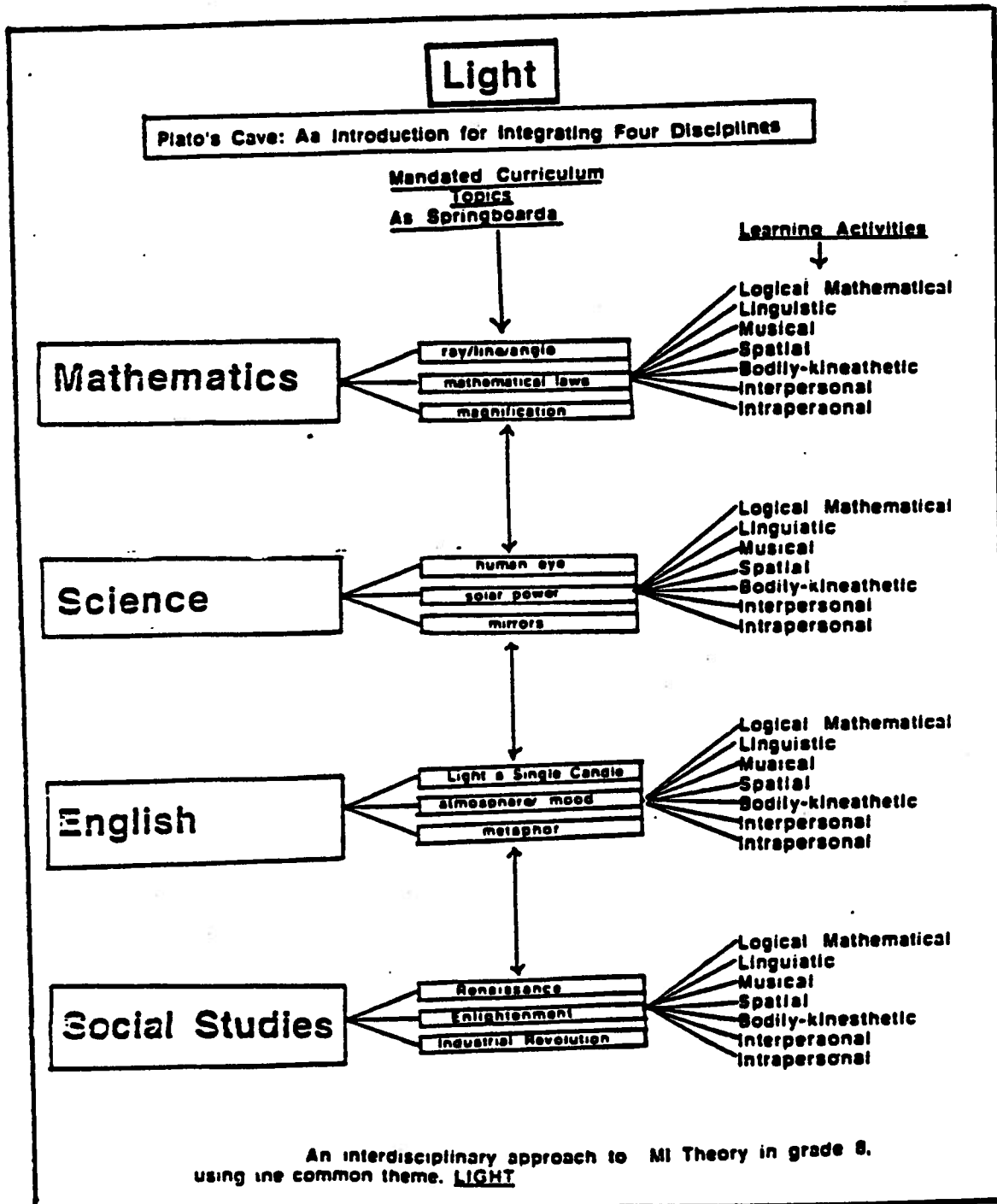
curriculum be considered as springboards to deeper understanding of the topic, rather than as an end in itself. That concept (of curriculum springboards) became central to the subsequent curriculum units designed and to the notion of curriculum used in the MITA model. At least three mandated topics from each discipline in the grade 8 course curriculum were chosen, for example, as we related curriculum to one theme in each unit designed. Figure 4.3 illustrates the format used in order to list core curriculum topics and identify learning activities from each of the seven intelligences. Our collaborative meetings in which this format was developed, not only assisted the team to clarify our own curriculum directions, but enabled us to gain an appreciation and interest in one another's disciplines.

4.3.6 Inviting Parents' Ideas

The teachers wanted to increase communication, not just with other teachers, and with students, but with the wider community. According to Eisner (1993), curriculum needs to reflect, "tasks they (students) will encounter in the world outside schools, not merely those limited to the schools themselves" (p. 226). While we recognized the value of exchanging ideas with parents, our team was initially at a loss how to initiate such communication. One teacher suggested we use the interest inventories as a starting point. His idea was to have parents complete an interest inventory, like the one shown in figure 4.2, and then to file and compare both student and parent responses. This idea was enthusiastically received by the team, since we had hoped to involve parents and other adults from the community in our work.

Thus home interest inventories were distributed so that parents could express their perceptions about their teenagers' interests. This exercise served three significant

Figure 3.4



functions. First, since parents know more about their kids than teachers ever will, it supplemented the students' inventories of their different proclivities and weaknesses. Secondly, since parents will often provide resources for the thematic units such as experts to visit the class, or materials for a play, it involved them in the planning process. Thirdly, once parents understood the planning process and shared in the curriculum development, they would undoubtedly be more interested in their teen's progress, and in providing more support at home.

4.3.7 Consulting with Each Student

Until this stage students had, for the most part, been involved in both large and small group discussions. Informal, individual meetings with the teacher were imperative. Research shows that students who discuss issues one-on-one with teachers do better in school than those who do not (Hargreaves, 1988). Such discussion provides opportunities for students and teachers to negotiate a variety of ways for students to approach problems. Eisner (1993) argues that, ". . . tasks should make possible more than one acceptable solution to a problem and more than one acceptable answer to a question" (p. 229).

Use of the interest inventory generated discussions concerning both the student's abilities and interests. Such dialogue also provided opportunities for the student and teacher to communicate concerning the directions for the individual project, or performance-based assessments. These student-teacher conferences required the teachers to take on more the role of "*guide to the side*" as opposed to "*sage on the stage*" (Taylor, 1991). (See Appendix C for such a sample activity sheet which may be filled out with the student at this conference.)

In the next section, the assessment criteria for these activities are discussed. Assessment may also be negotiated with students at the individual conference or with the class as a whole. While it is true that the assessment criteria negotiated for many of the students' projects may be similar, it is also true that teachers and students who spend time communicating and sharing ideas for these criteria, both benefit from the learning process.

4.3.8 Negotiating Assessment Criteria

Assessment, according to Eisner, "should reveal how students go about solving a problem, not only the solutions they formulate" (p.226). As our team discussed methods of assessing the process as well as products, and as we discussed the student projects, we began to develop vocabulary for describing the dimensions of student progress. The MITA Model suggests several different dimensions for assessing projects. Our discussions often centered around the notion of assessment criteria. While we did not wish to limit assessment to the rigid numerically expressed outcomes of short answer tests, there existed a concern that projects not be diminished to the 1920's project ideas of "anything goes" (Kliebard, 1986). The team expressed frequently a concern for genuine assessment, and we identified criteria for performance-based assessment activities. The following criteria list is based in part on recommendations for performance-based assessment by Zessoules & Gardner, (1991) and in part on student and teacher recommendations for negotiated assessment. Each project, it was concluded, should:

- provide rich contexts as background to the study
- relate to life beyond school

- display knowledge/skills and understanding
- exhibit strengths of the student's abilities
- encourage cooperation among students and teachers
- encourage a reflective stance on learning
- culminate in meaningful end-states or products
- demonstrate suitability for interdisciplinary work
- provide possibilities for original work
- lead to further interactions between students and teachers

In addition, teachers outlined six dimensions for assessing all projects. Each was discussed with students through classroom teaching and individual assessments were negotiated with students through discussion and conferencing. The dimensions used for assessing the projects included: 1). conceptualization; 2). presentation; 3). quality (technique, originality, accuracy); 4). individuality; 5). evidence of cooperativeness (this includes working with others, use of different sources etc.; and, 6). coherence with curriculum topics.

4.3.9 Displaying and Presenting Projects

At the end of the thematic unit the students discussed and debated their projects with others, including the out-of-class community. According to Eisner (1993) . . . "tasks should reflect the values of the intellectual community from which the tasks are derived" (p.227). This stage provided an excellent opportunity to invite the community members to the school for the presentations and displays. The work would be more appreciated by all who helped formulate the original ideas and the community would be provided an

opportunity to show their appreciation to students. Students, on the other hand, would be prepared to interact with community members, and to explain their work, responding to questions and concerns.

4.3.10 Videotaping and Filing Projects

As a means of documenting students' work and progress, the MITA Model includes a component which recommends that a library of each student's projects should be collected throughout the school years. Students and teachers would decide collaboratively how these files are to be gathered and stored. The format depends, for the most part, on the particular resources available, as well as the creative ability of the organizers to gather and disseminate the information. Students may enjoy taping and filing videotapes on their projects and presentations.

4.4 Summary

In summary, the MITA Model, as it is described in this chapter, was the outcome of the collaborative efforts of 8 students and 4 teachers and myself. The construction of the model was influenced by students' and teachers' perceptions of the development of individual differences in high school. It provides a heuristic which may be useful in the introduction and application of MI Theory in similar settings at the high school level.

CHAPTER 5: STUDENT PERCEPTIONS OF SCHOOLING AND THEIR OWN ABILITIES

5.1 Introduction

The results of this study are presented in three chapters. In the previous chapter, the Multiple Intelligence Theory Application (MITA) Model was described, in response to the first and main question guiding the research. Chapter 5 presents the results and analysis of the study, in response to the second research question, "What was the role of the students in the development of the Multiple Intelligence Theory Application Model?" In other words, how did the students respond to this curricular initiative which was based upon an application of MI Theory? Chapter 6 concludes the results section, and responds to the third research question, "What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model?"

5.2 Student Responses to Research Question Two

Chapter 5 is organized in five sub-sections: time, space, authority, subject matter, and people. That is, how did the students respond to the questions I asked concerning: the use of time in high school; the role of space at school; the existence of student authority in the classroom (i.e. who exerts authority in school?); the role of subject matter; and, the involvement of other people in their class activities? Since these foci isolated significant aspects of the curriculum initiative, they were used to organize the interview questions. In particular, I was interested in exploring how these curricular aspects or components influenced the extent to which the students' own individual differences or perceived intelligences were acknowledged. I was also interested in how their interests and abilities were used in their school experiences both before and after the

integrated curricular unit. Furthermore, since students responded to each of these five questions in most discussions concerning curriculum and MI Theory, the five foci also provided natural categories for analyzing the data. The data are organized in such a way that the students' responses to their regular school activities are discussed first, and this is followed by a discussion of how these issues were addressed in the study through the use of the MITA Model.

Data were extracted from two in-depth interviews held with each student, from several informal group discussions, from students' written responses to MI Theory concepts (see Appendix J and K) and from my observations and discussions of the students' projects (see Appendix L for a timeline and list of suggested project topics). For each of the five categories the research outcomes are stated and discussed. While students had less to say about time and authority, their detailed discussions in sections 5.4, 5.6. and 5.7. reflect greater input during our discussions on the topics of space, subject-matter and people. Finally, Figure 5.1. shows the students' descriptions of their final projects as these related to their previously identified intelligences illustrated in Figure 1.1

Sample quotes from student interviews described in Section 1.3.2. in Chapter 1 illustrate the way in which the students' interview questions were structured to elicit the student responses outlined below.

5.3 Students' Perceptions of the Use of Time in School

Concerning time, students typically expressed the fact that because teachers "had to cover " certain curriculum in the textbook, there was often too little time in school to consider their own unique abilities. Some students also recognized and showed compassion for their teachers' similar frustrations. For example, in the first interview Keith

expressed the idea that there were "no solutions" to these perceived time problems, and that "teachers have no choice" but to cover all the mandated curriculum. The factor of "not enough time to cover all the work" appeared to most students to be one main reason their high school curriculum was often not extended to accommodate their individual abilities.

Seven, out of eight students suggested that a major reorganization of time would be required, in order to develop their individual interests and abilities at school. Students frequently suggested that while inadequate time was devoted in high school to developing student individual differences, nothing could be done to remedy this problem under the existing high school structure, because, as Kara said in the second interview: ". . .there is so much curriculum they have to cover . . . "

Several students and teachers cited the problem of an inflexible prescribed "core" curriculum in high school. Interestingly, lack of *time* was also cited as the greatest barrier to the cultivation of more "potential learning opportunities", in Brown's (1991) findings (p. 237). While Brown talked to teachers and administrators, he unfortunately failed to talk to students. He concluded: "We were told that there simply is not enough time in the day to challenge every student or provide personalized opportunities for learning" (p. 235).

What can be done to address the time problem identified here? The students suggested the following solutions. While several students mentioned that typically only 3 blocks per week were allocated to subject areas of their strengths and interests, Sam suggested that classes be divided, not into blocks for each discipline, but merged "into one class where you learn about specific themes." Keith and Les both wanted to see more time for individual projects, and Les, added that more time was required for

individual development, particularly with more time to relate "with the girls in his class concerning important issues".

Some written references to the use of time in high school were also made. Elaine's written response in a Social Studies' assignment, for example, illustrated her teachers' use of time, by showing how time is typically apportioned in her classes:

They (teachers) need to stand in front of the classroom all day teaching students. They have to talk all the time, answer questions, make sure their information gets through to the students, mark your work, put up with students that talk when they talk, and put up with the daily stresses of the teacher. They have to sometimes talk over 30 other voices.

Brown (1991) would argue that Elaine and the other students identified significant high school organizational problems here. According to Brown, the problems concerning lack of time may in fact be embedded in a larger systemic problem, concerning the way we organize an average day in the high school. To illustrate this, Brown argues that time, unfortunately, has become the fundamental unit of education, rather than the substance of what we teach. Brown goes on to illustrate what this error has come to mean in terms of development of individual differences among students:

We do not ask what a high school graduate knows about mathematics; we ask how many years of mathematics she has had, a year being the total number of forty-five minute periods during which she was seated in class. This turns out to be about 132 hours, or sixteen and one-half work days. Some year. We award credits and degrees for time spent in a seat. Curricula are laid out in terms of scope-and- sequences pegged to

time in class. Reading skill is expressed in terms of time; tests are timed.

Nowhere more than here are the contemporary institutions of education's roots - planted in early-twentieth century time study notions of industrial efficiency - so exposed. (pp. 235 - 236)

Has Brown not clearly outlined here, basically the same time problems that students identified, and does he not illustrate how the current divisions of time in high school too often work against students' individual development?

5.3.1 Time Concerns As they were Addressed in the Study

The MITA Model, (described in Chapter 4) addressed students' concerns about time in two specific instances. Phase one of the Model, *collaboration among teachers*, illustrates the teachers attempt to construct several units of curriculum around one common theme. Their main intention was to dissolve some aspects of the rigid barriers between disciplines, and to think more in terms of interconnections. Through the introduction of a thematic curriculum, the teachers and I felt we could resolve the problem of "too much mandated curriculum to cover in too little time." Through a combination of approaches to each theme, with the four teachers and four disciplines sharing the themes, the coverage of curriculum would also be shared. The result of such a shared approach was that different parts of the curriculum were simultaneously introduced and emphasized in all four classes. In addition to addressing the problem of too much curriculum to cover, the teachers also responded here to the students' concern that more time and emphasis be placed on the development of students' interests and abilities.

The students concern about "too little time" was also addressed in the MITA Model's fifth phase, *linking mandated curriculum*. The question we asked here was:

"How can students cover the required curriculum without becoming bound by it?" Figure 4.3. illustrates the format we developed in order to link the curriculum and also to provide an opportunity for students to express their knowledge of the curriculum in at least seven different ways.

The students were given one month to complete their final projects for the interdisciplinary studies unit, for which they were awarded 10 per cent toward their final grades in each of the four disciplines, English, mathematics, social studies and science. For the most part the projects were researched and completed outside of the regular instruction time. Teachers each allocated several class periods to be used for library research, however, and designed several sessions for small group discussions on the project topics. Since no students, when describing their final projects, directly expressed any concern about a lack of time, and since all their projects were successfully completed before I viewed them with students shortly after the completion date, we can assume that the one month allocated for these thematic projects was sufficient.

When Keith described his project, he indicated that he had adequate time to both reflect on different project ideas and enough time to change directions in order to successfully complete a 22 page short story. In Keith's words:

Ellen: Could you tell me about your project?

Keith: Well, um, see originally I was going to do a newspaper . . .

Ellen: Yes.

Keith: . . . on, ah, personal change . . .

Ellen: On personal change?

Keith: . . . yeah, but um I changed it because it was so boring.

Ellen: You found it boring?

Keith: No I found the newspaper format so boring right? So I made a story instead?

Ellen: Okay?

Keith: And I sort of made like a fantasy?

Ellen: A fantasy?

Keith: Yeah. Uh, it's from, it's relating to um to it relates to heaven and hell. Okay, anyhow now it's me and I have a car accident . . .

Ellen: Yes?

Keith: And then then I have this other scene where I have where God or whatever, an angel or . . .

Ellen: A higher being.

Keith: . . . um from the heavens, and from hell, they're arguing whether who should take who, like whether I belong in hell or I belong in heaven? And um through that argument my life is uh reflected and uh . . .

Ellen: Where did you get the idea?

Keith: . . . well, it was a last minute idea. I don't know, it just popped into my head. That was like, that was like, I don't know, there was a week left or so, right? So I had to do something. That just came.

Ellen: So, what part of it did you enjoy doing the most?

Keith: Um, actually writing about my life. Like actually, um, going back through my earlier years.

Ellen: Yes.

Keith: Um, it's it'd like I had to reflect on my other experiences and, um, on some of the the experiences that have probably cultivated some of my characteristics, and so on.

Ellen: So you enjoyed the reflection part the most.

Keith: Yes.

Interestingly, Keith had expressed in his first interview that there were "no solutions" to the time problems, and that the teachers had "no choices". In that interview he was referring to a lack of time to cover the prescribed curriculum. But, in this final interview he indicated that he had adequate time to create a project idea, to reflect on it's development and then to change directions in order to complete his 22 page short story.

The MITA Model provides two solutions to the time problem. First, using the MITA Model, teachers would communicate frequently with one another. The teachers, in other words would address time concerns for the assignments given in each class. While one teacher administered a test or major assignment on a particular day, the other teachers might plan in-class assignments, for example, or might extend the time provided for the completion of a task. Second, according to the MITA Model, teachers would brainstorm with their students and would discuss with students possible dates and criteria for each

project. In this way the teachers and students would plan together an adequate time period to complete the work.

5.4 Students' Perceptions of Space at School

Concerning **space**, students appeared relatively unimpeded by the traditional restraints of an average high school classroom. The rooms were sometimes described as poorly equipped, but the actual space and setting appeared to be comparatively unimportant to teens. What was expressed as significant, regarding space, was the importance of conversing with peers in meaningful ways, which could only take place with flexible seating arrangements. In fact the students shifted my emphasis away from the physical aspects of space and highlighted the importance of "psychological space" (or friendships), an area I had failed to address, in the original research questions.

Students suggested that friendships can be linked to higher quality work, and most of them wanted increased collaboration with friends. They unanimously agreed that friends were the most critically important aspect of their education. Keith put it this way, "I can say that our class is quiet but we're really close together." He then emphasized his point, "Therefore it's nice. Like the environment is really important." Keith attributed the notion of friends' support to homogeneous groups, stating that ". . . I guess if you're travelling with a group of people that have the same interests . . . you learn a lot more."

Kara expressed the need to have more opportunities for students to teach each other, "because we do that sometimes, but if you had a younger grade or something like that, or you got some people that you actually got to tutor." In addition to telling stories about the benefits of teaching others, Kara also told of students tutoring her, especially in mathematics. "Well, I call my friends. See a lot of my friends are really good in math

and science, so it works out well." Sam indicated: ". . . if I don't understand something, they're the ones I ask." When asked who contributed most to his grade 10 class, Keith responded: "Friends", adding: "Yeah, like peers. . . . I think close friends are the most important thing right now."

Several boys wanted seats rearranged so that they could relate to more of the girls. Les said, "I'd mix the girls up more with the boys. That's it . . . I'd have the girls and boys work more together . . . because you get different ideas when you work with the girls, and not just the guys." Sam argued that desks should be arranged in "two big rows . . . like you had in elementary school." There he described "the desks were connected. We were facing one another." He added, "That was really good . . . because you could talk to everybody. You could see everybody." Cathy suggested desks should be arranged, "like maybe in a circle or semi-circle or like . . . not so structured." Then Cathy decided that she wouldn't have desks at all, but would have tables instead, "where maybe six people could sit at a table".

Several students recommended that classroom space might be better utilized in order to accommodate peer support. Elaine, for example, said that "seats should be rearranged more, so that students could sit with their friends and make new friends on a regular basis". Les suggested that more student reactions were needed "to whatever is being done" in school. Although gender distinctions were never identified by the girls as having any significant influence on the curriculum issues we discussed, several boys did indicate a desire to include more girls in their group interactions.

Students indicated that friendships influence their sense of well-being at school, both by giving them greater support as well as helping them to learn. In Elaine's words: ". . . if I have problems and I don't understand, then I like working in groups to figure it

out." She suggested that fellow students actually contributed to her curriculum program more than any person, because . . . "we sort of help each other." Elaine added, "When we have problems . . . like when we don't understand something we ask each other, instead of the teacher sometimes." Elaine even suggested that students should be encouraged to participate more in guest speaking, and that former students should be invited in as they would be, in her opinion, "more interesting." The students' emphasis on the important relationships between friendships and learning is not surprising, according to one recent youth survey (Bibby & Posterski, 1992). According to Bibby and Posterski, in a cross-Canada youth survey, friendships ranked even higher than family relationships in teens' estimation of relational values and enjoyment.

But what does this student emphasis on friendships suggest to teachers and to curriculum developers? What would some students say about the opportunities for learning from their peers? Is it possible to create curriculum opportunities that will challenge and equip students, without understanding and incorporating the values they hold highest? Are there embedded opportunities within curriculum for meaningful peer interactions? West (1985) would agree with these students that peer evaluation, for example, is one way to develop an atmosphere where students would learn more about the subject, about themselves, and about learning (p.176).

How much attention do adults give to the high significance teens place on their friendships? Could the lack of attention given here be attributed to what Fullan (1982) suggests is our lack of knowledge about what students think? More important, how are friendships, and their potential value for development of student abilities, factored into the curriculum organization in high school? The fact that students in this study shifted my attention away from the physical space of classrooms to the psychological space of peer

relationships suggests that students support an emphasis on meaningful peer interactions as part of their high school learning experience.

Just as researchers Bibby & Posterski (1992), reported that friendships were extremely important to teenagers (pp. 199 - 206), this fact was repeatedly expressed by the students in this study. Interview questions that related to physical space of classrooms, brought the students comments about friends and peer support. Where I had intended a discussion about seating arrangements, for example, the students spoke of friends who sat near them. Students also identified opportunities that the school environment provided for nurturing friendships, as more significant than the mere physical layout of their classroom. In fact the surroundings were much less important to teens than to their teachers. Friendships, on the other hand, rated highest on the students' list of what is needed at school.

5.4.1 Space Concerns as they were Addressed in the Study

Students' concerns for more opportunities to interact with their peers were addressed in the MITA Model, especially in phases two and ten, as illustrated in Chapter 4. In phase two, *brainstorming with students*, the students participated together in the curriculum process. Not only did this stage provide opportunity for students and teachers to collaborate, but it created an environment where students collaborated with one another on each topic. Students, for example, were encouraged to choose partners or form groups in order to explore different aspects of the common themes. At times they raised questions and communicated their ideas individually within the large group. At other times they exchanged ideas in small groups.

The phase ten component, *videotaping and filing projects*, was included in the MITA Model partly to provide students with opportunities to work together. While this phase was to have taken place following the completion of their interdisciplinary projects, the teachers' strike prevented the model's full application. Thus, one can only speculate that phase ten, the process of students videotaping and filing projects, would have addressed their concern for additional opportunities to interact with their peers within a learning environment.

Since students were provided with choices for their interdisciplinary units, some collaborated to generate project ideas and created ways to work together. Sam, for example, described how he interacted with his peers during this final project.

Ellen: Okay, Sam! Will you tell us about your project?

Sam: Um, I did something that was almost exactly what you are doing right now. I went and interviewed people about school, and how it related to our interdisciplinary studies, our subject areas. Um, I just asked them how their activities outside of school and um their interests related to school and what they learned and how it interrelated. So I just asked them . . . (both talking at one for a brief time)

Ellen: Who did you interview? Students, these people? or outside adults? or where they already in school? or finished school? or both?

Sam: I interviewed whoever I could. It was mostly students. There was one or two adults in the uh tape. . .

Ellen: The tape.

Sam: Yeah.

Ellen: And then how did you write up your study, And what did you find out? What kinds of things surprised you that you found out?

Sam: Well, okay, I didn't write up a study. I handed in a tape which was, um, with my comments in it, and learned, um, that people think that they don't learn anything in school, and most of the time their interests in what they learned in school and what they're interested, the subjects they're interested in is totally different? They're almost nothing in common. Usually.

Ellen: What would you do about that . . . Sam? Is there anything that can be done about that?

Sam: Well . . .

Ellen: Are you suggesting that school might be more related to students' interests and what they do well? You said it almost isn't. almost is always not related. Did you think that it should be related?

Sam: Yes

- Ellen: Yes. Can you give me any examples of what was not related? Things that people really liked to do and then couldn't do in school?
- Sam: Okay, um, (pause) there's someone, they liked sports . . .
- Ellen: Yes . . .
- Sam: . . . but they they in school they liked photography and like their, or activities they like bike riding and well i can't remember it well but there wasn't anything that was similar.
- Ellen: Okay . . . alright. That's interesting. So actually that is exactly what I'm doing, because I'm looking at what the things that you'd enjoy doing and that you're good at that are part of your schooling and you've been helping me to do that. Was it a worthwhile project? Sam? (pause) Did you learn something important from it?
- Sam: Not really.
- Ellen: What would you have done differently if you did it again?
- Sam: I would ask some different questions, and made it more specific.
- Ellen: It's hard to ask interview questions . . . and draw people out. When they're real quiet, it's hard to know what to do.
- Sam: Most people just answered with one word answers, they didn't give me anything else so . . . it was kind of hard, but most people, the adults I did, they went on and on and on!

In spite of Sam's obvious lack of interview skills, and the young interviewees' lack of communicating skills, which left him short on data, and without adequate responses to some questions, Sam described his significant efforts to interact with others. Perhaps one of the most important results from Sam's project is seen in his reflections near the end of our talk. Here Sam clearly identified his errors during the interview experience, and suggested that he would reword the questions in future, in order to make the questions to his peers more specific. Sam's interactions with his peers and his personal reflections in the above segment show Sam's progressive development of his own interest and ability to communicate and work with others.

5.5 Students' Perceptions of their Own Authority in School

Concerning authority, students usually described their teachers as flexible, and concerned. They felt, for the most part, that they were given some authority to develop

their own abilities, but four students agreed that they learned most from teachers who, as Cathy said, "get closer to the kids," and as Les added, "get on our level".

Students generally said that teachers held all or most of the authority over their learning but sometimes indicated they were given choices. They also described additional people with authority. Kara, for example attributed authority to "people who make the texts" and Cathy said the teachers and parents "shared authority" over her learning. For Joe, other students possess authority which they express "in different ways". The following segment from my second interview with Joe elaborates this point.

Ellen: Ok, can you tell me what you mean by that?

Joe: Um . . . like uniqueness I guess . . . Like if you're funny then you're always the one making jokes in class . . .or . . .

Ellen: OK?

Joe: . . . um . . . if your like athletic then if you're always the one whose I dunno . . . talking about it or playing it all the time . . . and everything. . .

Ellen: Yes. And so do you think everybody has . . . ah . . . a lot of authority to develop that um . . . unique ability?

Joe: Um . . . Yeah. Cause I see many unique. . . Everyone's quite a bit different in my class. . .

Ellen: Yes?

Joe: Yeah . . .

Ellen: And do you feel that you have opportunities in class to express your own uniqueness as well?

Joe: Yeah, I think so.

But while Joe suggested that students possessed authority to express their different abilities in school, he had not related that authority to any high school curriculum topics. In fact, as evidenced in the following segment from later in the interview, Joe was unable to identify any incident where he used his own authority to express differences within the current curriculum.

Ellen: OK. Good. What are the topics that you've learned about that are important to you in school this year?

Joe: Um. Ah.
 Ellen: Any topics at all.
 Joe: Um . . . Canadian history. . .
 Ellen: Uh huh.
 Joe: Um . . . I dunno. Like science stuff. Stuff that you learn like . . . like how they .
 . . like invented all these things that we have right now. . .
 Ellen: Uh huh.
 Joe: Um . . . like electricity. . . Um . . .
 Ellen: Yes.
 Joe: Um . . . ah . . . anything else important . . . ?
 Ellen: Ok, those are . . . those sound interesting to me. . . Of those topics which
 allowed you to use your own ability. Were there any opportunities to express your
 own different abilities?
 Joe: Not really. . .
 Ellen: OK.
 Joe: No . . .

I further questioned Joe to find out how he would reconstruct the current curriculum
 so that he had more authority to develop and express his own abilities and interests.

Ellen: OK. What topics or activities would you add to a program in order to maximize
 your own highest abilities? If you had the choice to . . . to choose or make
 activities happen in grade ten what would you add?
 Joe: Um. Maybe more group activities... .
 Ellen: OK.
 Joe: Like . . . um like more . . . I dunno . . like more group projects or something . . .
 Something that less stresses the individual stuff Um . . .
 Ellen: OK. So are you saying that you would advocate a curriculum that looks at students
 being able to work in maybe three's or four's?
 Joe: Yeah. Like . . well not all the time . . but . . .
 Ellen: More of the time.
 Joe: Yeah. More.
 Ellen: OK. So in other words, kids like working with other kids.
 Joe: Yeah. Mostly we have friends and everything. That's . . . It helps . . . and there's
 more ideas and stuff.
 Ellen: Yes. It sure does. Well, that's great.
 Joe: Yeap.
 Ellen: OK. How would you describe the role of students and the role of teachers in
 bringing information?
 Joe: Well, students give . . . give ideas and stuff . . or answers or from the questions
 that the teachers give you. . . .
 Ellen: Uh huh.
 Joe: Um and like they just . . . Students tell what they feel about it. . . whatever topic
 it is. . .
 Ellen: Ok. So they have a pretty active part as well?

Joe: Yeah.

Ellen: OK. And so you think that's a good idea.

Joe: Yep.

Ellen: OK. Who would you ask to participate in the program in order to develop your own highest abilities? If you could set up a school for you and in order to develop the things that you do best , who would you ask to participate in that program?

Joe: Friends, I believe that would help a lot. . . um . . .

Ellen: OK.

Joe: I think everyone's opinion, like friends, teachers and parents. . .

Ellen: Oh Ok. So that's interesting that you would say parents. So would you have the parents more active in the schools?

Joe: Um . . . a little bit.

Ellen: OK. In what way do you see that happening, Joe?

Joe: Um. . . more and more conferences involving the parents.

Ellen: OK.

Joe: Like informing them more.

Ellen: Yes.

Joe: Yeap.

While some of Joe's comments in this last segment clearly relate to other curriculum foci discussed in this work, I included the final interview segment here in order to illustrate how Joe recommended increased student interactions, more group work and indicated that authority over learning could be shared among friends, teachers and parents.

For Keith the teachers held most authority, but for Elaine the math teacher did not need to use his authority. Student authority, for Elaine, increased with one's ability and understanding in a subject. Because she could already do the mathematics, Elaine described that she had more authority to learn in her math class. Her photography teacher, however, did exert authority, since photography is not so straightforward, according to Elaine, and therefore she needed more guidance and structure. Elaine expressed her enjoyment of being able to do math alone, however, she felt frustration over having to watch examples be "explained over and over for those who could not get it".

Les said that teachers and students should be more equal, and in one informal discussion, began to explain how this equality might work. But after some elaboration on the topic, Les retracted his recommendations for more student-teacher equality. First he explained how teachers had to make up so many lessons and unit plans, and then he concluded that "maybe it's best the way it is, after all." Although, for the most part, students did not describe themselves in control of their own learning, several suggested that student authority was available to them in several ways. Joe and Keith, for example, suggested that they possessed the authority to learn whatever they chose to, or to choose not to learn something.

Following an in-class introduction of MI Theory by Mark and John, the students indicated a willingness to take on more authority for their own learning. In other words, they described their interests in developing their own abilities at school and increasing their repertoire of intelligences used in school activities. In written responses the students revealed a wide range of answers to the question posed in Mark's social studies class: "Are there other intelligences you personally wish to develop?" Les wrote, "No, I feel that I am developing all the intelligences", and Elaine responded, "I would like to develop interpersonal, verbal/linguistic, and bodily kinesthetic intelligences more." All but Les expressed a desire to further develop at least one particular ability. Kara stated: "I would like to improve my mathematical, and my musical abilities." Sam, replied in similar fashion, saying: "I would like to develop such intelligences as musical and mathematical, because this would help me to broaden my horizons, and give me new perspectives and ways of looking at things. Cathy extended the notion of intrapersonal ability and stated that she hoped to improve her "conscience and intuition," since, "conscience is what keeps us morally ethical, and human intuition is the immediate understanding of truths,

facts, or events without reasoning." Keith wanted to develop his verbal/linguistic, musical and interpersonal skills as he felt he was weak in these four areas. Each student seemed to be very aware of his or her personal strengths and weaknesses, and most thought they could be somewhat autonomous in developing their abilities in different areas. In summary, their comments affirmed the need for a high school curriculum that both acknowledges and accommodates students' authority or responsibility for their own learning.

In the same way, Stumbo (1989), Taylor (1991) and Lieberman (1992) concluded that students who are given more authority in school usually become autonomous, independent learners, the students in this study typically related that their increased authority to choose what and how to learn, significantly increased their learning opportunities. Taylor, for example, refers to a mutual respect between students and teachers that enables students to speak out and question all aspects of their work and environment. When asked how they could become more autonomous, some students in my study expressed a desire for more shared-power relationship with teachers, and related that students learn most from teachers who "get down" to their level and "get closer to the kids". Stumbo calls for increased student voice in the classroom, and more flexibility to extend their curriculum activities beyond the rigid setting in class, where traditionally students sat and listened and teachers talked. While students did not describe any flexibility to add new curriculum initiatives to their programs, they often indicated that they had authority to "make choices" from within the present structure.

5.5.1 Student Authority Concerns as they were Addressed in the Study

The MITA Model addressed the students' concerns for personal authority or empowerment, particularly in phases seven and eight, as illustrated in Chapter 4. "Authority" here refers to the control one has over one's own learning or the permission to learn subject matter content in a particular way. Phase seven recommends *consulting with each student*, and phase eight, *negotiating assessment criteria*. Both of the above recommended ways that would give students the authority necessary to make personal choices about their own learning.

Les described his choice in the final project, for example, to discuss the connections between four disciplines in an intrapersonal manner.

- Les: My project was on personal change.
 Ellen: Ahhh . . . why did you chose that topic?
 Les: (pause) Because . . . it seemed easy at the time. (laughs)
 Ellen: And what happened in the project? What does it look like? And what did you do?
 Les: It's uh it's like a life story. An autobiography uh comparing English, Science, Math and Socials.
 Ellen: Okay. Did you relate it in any way to debate? [Referring to his earlier expressed interests in debating]
 Les: Uh . . . sort of.
 Ellen: How?
 Les: Just decisions.
 Ellen: You talked about decisions. Did you relate it to singing or music?
 Les: Music
 Ellen: So how you improved and how you think you went sort of backwards [referring to an earlier statement made]. Okay. And what was the most interesting part of the report? What was the part you enjoyed doing the most? Of all that you did?
 Les: The baby years.
 Ellen: You enjoyed the baby years because you reflected back on those years? or . . . Why did you enjoy the baby years?
 Les: (pause) Because babies have nothing to contend with!
 Ellen: So you found that the choices that you were forced to make and all the things that you had to do later were harder.
 Les: Yeah.

Ellen: Or were less interesting. Where did you get your information? Did you have to interview people? I mean you wouldn't remember when you were a year old.

Les: I don't know, I had to ask people, my mother, aunts and uncles, and you know see what I was like.

Ellen: And did you tell in the story what they said?

Les: Yeah, yeah I incorporated it into the story.

Ellen: So you actually had interviews incorporated into your story.

Les: (pause) Sort of.

Ellen: Did you do any art? Did you use any pictures? What did . . .

Les: No (laughing) it was just a plain report!!

Ellen: Just writing.

Les: Yeah, just all writing.

Ellen: So there were no pictures in it?

Les: No pictures.

Ellen: But do you remember how long it was?

Les: (long pause) I don't know. It was like 20 some pages.

Ellen: 20 some pages! that's amazing! What would you do different if you were to do it over again?

Les: Don't do it at all.
(both laugh)

Ellen: Okay, I'm going to ask you a hard question then! How did it relate to Math?

Les: How did it relate to Math? (pause) The quantity of statistics uhm what else let's see . . . Math the course that I took at school!

Ellen: Yes.

Les: Um, uh, um, figuring out you know money. Stuff like that.

Ellen: Okay, how did it relate to Socials

Les: Socials? History, geography, you know, who I am. and, uh . . .

Ellen: Where you came from.

Les: Yeah.

Ellen: Where you're going.

Les: Economics.

Ellen: Economics? Interesting. How did it relate to English?

Les: English? The presentation, uh, the, uh, the language, (long pause) . . .

Ellen: How did it relate to Science?

Les: Science. I was born! That's what!!

Ellen: (laughs)

Les: Yeah and I grew! That's one!

Ellen: Okay.

Les: Uh . . . uh . . . (pause) Weather, what Vancouver's like.

Ellen: The weather, okay. The topography in Vancouver?

Les: Yeah. Rain.

As the above segment indicates, Les appeared unsure about some of the relationships that existed among the four disciplines. Nevertheless his project description provided a clear demonstration of the subject matter which he personally selected to relate to his own personal interests and abilities as well as to the grade ten required curriculum. Les used his authority to relate the project work he did to several of his own interests and abilities. For example, he used an autobiographical approach to reveal and examine his own interests in intrapersonal issues, mathematics and economics.

5.6 Students' Perceptions of Subject Matter

Concerning **subject matter**, students most enjoyed topics that related to life beyond the classroom, and expressed interest in topics that allowed them to use what they considered to be their "passions". Some students expressed a particular enjoyment for curriculum experiences that provided hands-on activities such as the wood lice experiments described in detail (see Chapter 1) by Elaine, Kara and Keith as enjoyable and worthwhile. By way of contrast, they sometimes referred to "dry" text materials as unrelated and boring.

Several students identified examples of real life connections which they enjoyed in most of their classes. Elaine spoke of the contests in math, which made sense to her since she could apply the mathematics concepts to life experiences that she understood. Sam spoke of the Pacific Rim studies relating meaningfully to various ways of life, and therefore taking on meaning for him. Sam suggested that school should be "related to life and to work after". Sam described a unit introducing people in different careers, where a Credit Union manager came in to teach the class: "Like last year we took business education . . . And the teacher brought in a man from the credit union and he

helped us do our project. That . . . we were selling shirts . . . So he was really helpful in doing that." Then he went on to explain that schools need more of that kind of connectedness to real life - people from the community, and people from different careers. Chelsie also enjoyed school when curriculum was related to the world, and she could see the connections.

In addition to topics that related to the real world, the students enjoyed subject matter topics that accommodated their individual interests and abilities. How were their ideas about subject matter and MI Theory documented? In the first interviews students responded to questions about their subject matter, without any prior knowledge of MI Theory. At about midway through the study, the students were introduced to MI Theory in class by three of the four teachers. The idea was to expand the students' vocabulary about their interests and abilities and to communicate with them about MI Theory ideas.

All students in the study were given an opportunity to respond in written form to their perceptions of the ideas put forward by the teachers and myself regarding MI Theory as it related to subject matter. How were students made aware of the main ideas in MI Theory? Mark, the head teacher, first introduced MI Theory to his grade ten social studies class, in which all eight students participating in the study were enrolled. Although I obtained data on the whole class' response to MI Theory ideas, I will focus upon the 8 students in his class who were the student participants in this study. Those eight were interviewed after the introduction of MI Theory, in order to obtain more information about how the students related subject matter to MI Theory ideas.

The students in Mark's class discussed MI Theory using four categorical topic areas. These areas included students' perceptions of their own intelligences; any changes in their perceived areas of strength over time; the development of additional intelligences;

and, their perceptions of their teachers' strengths. Following this classroom presentation and discussion, the students graphed (on both line and circle graphs) their perceptions of their own strengths and weaknesses. Mark adapted and used a Multiple Intelligences Summary Wheel (Lazear, 1991, p. 197) for this purpose. For an illustration of how two students' (Kara and Sam) responded on this wheel, and to the questions, see Appendix I. Within the wheel each intelligence is represented under several descriptors. Musical, for example, is represented under music structures, schemas for hearing music, sensitivity to sounds, and so on. Each of these divisions was clarified by Mark in class, so that students understood the meanings intended. Mark then designated seven lines on each of the intelligences represented, so that the students could indicate for each intelligence represented, roughly where they perceived their strengths and weaknesses to be. Simply put, the students charted their perceptions of their own intelligences. Because the wheel provided an equal section to represent each of the seven intelligences, the students could compare their perceived individual abilities. That is, students could compare their perceived musical abilities with their perceived mathematical abilities and so on.

Next, Mark engaged the class in a discussion concerning the development of individual differences. Students were asked to write, what Mark referred to as the "professional use" (in a career) and the "personal use" (for personal enjoyment) of each intelligence. Two sample charts which illustrate the students' perceptions concerning the expressions of each intelligence, are listed in Appendix J. The exercise was intended to both increase the students' understanding of MI Theory, and to relate the theory to real life. The students then responded in written form to four related questions (see Appendix K):

Students appeared especially aware of their progress in development of abilities over time. When asked how she had changed from childhood to adulthood, for example, Elaine wrote:

As a child I did not have physical strength or endurance or skill to carry out some sports and physical activities. My body did not develop enough to enable me to do these things. For example I could not throw a ball accurately. As I got older I could succeed in all the fundamentals. Visually and spatially, I haven't changed much. But I've improved quite a bit in the verbal and interpersonal. My musical abilities have always been there.

Elaine's was a typical story, only the variations and abilities described differed. But all of the students expressed an awareness of where they were strong and where they were weak, and most of them saw improvement in some areas and reported a desire to improve the others. Keith told of how he grew in confidence over the years, through his successes in bodily/kinesthetic, interpersonal and verbal skills. He attributed this confidence for his change from "shyness, protectiveness and narrow-mindedness" to a "greatly improved" academic achievement.

In reference to the subject matter content they learned, students demonstrated an ability to discern their strengths and weaknesses realistically. Confirmation that students had accurately described their apparent mastery of the grade ten subject matter, came from other students about their peers during our group discussions. Three students, for example, referred to Elaine's success in mathematics. Students also spoke of the benefits of doing many activities that would give them opportunities for practice. Sam

suggested that having a mentor to help him practise would also be beneficial. It is interesting to note here that while their abilities as described by the students varied, students typically shared a common desire to take part in a variety of different activities and to be provided the opportunity to exercise many abilities.

5.6.1 Subject Matter Concerns As They Were Addressed in the Study

How did the students' perceptions of their individual abilities and interests as evidenced in their work in school subjects differ before and after the introduction of MI Theory? During our first interviews and early discussions, the students had no knowledge of MI Theory. By the time students described their final year's projects, however, they had been introduced to MI Theory concepts. Interestingly, their ideas about "subject matter" unlike ideas about the other four foci: time, place authority and people, show significant changes over the year that I worked with students. Certain changes were evident from the beginning interviews to my final discussions with students on the topic of subject matter.

In order to compare students' responses about their perceptions of subject matter in the initial interviews which occurred in September, with their final description of the role of subject matter in their projects, in June, first, it would be helpful to review briefly students' initial responses. As previously illustrated in Figure 1.1, students varied broadly in their initial identification of what we came to call, their "passions" or their individual abilities and interests. In the first interviews, except for the opportunity to choose electives, the students did not identify any significant relationship between their interests and abilities and their high school curriculum's accommodation of these. However, when these abilities and interests were discussed in the context of their final June projects, the

students documented significantly increased interests and abilities that were expressed in their projects.

As earlier stated, the final interdisciplinary projects were a product of the collaborative efforts by four subject area teachers, and these were assigned 10% of the students' final mark in each of the four subject areas: mathematics, science, socials, and, English. Students were expected to create a project based on the unit theme for the term, to use as many of their intelligences as possible in these thematic projects, and they were also expected to show some relationships among the four disciplines, in their work.

When interviewed about their projects, several students identified additional intelligences to those mentioned in previous interviews (see Figure 1.1), which suggests that students were able to describe a wider range of abilities after their introduction to MI Theory. Some, however, did not perceive any relationship between expressed interests and abilities and the subject matter in their interdisciplinary projects. For example, Joe, did not mention Socials or English in the initial discussions, but expressed their lack of relatedness to his project in the follow-up discussion. Les, on the other hand, referred for the first time, to intrapersonal, interpersonal and mathematical skills that came into play in doing his project, three intelligences that were not mentioned as abilities in former discussions.

How did the students use their different abilities to develop the subject matter dealt with in their individual projects? Kara recognized the use in her project of several different abilities and was able to identify her use of multiple intelligences. In contrast, Chelsie, Cathy and Keith described several of their previously listed intelligences, as non-existent throughout their projects. While some intelligences did not relate to students' work, many of their abilities appeared to be useful for the integrated projects they described. In

summary, through students' interviews, I was able to document their perceived abilities as they related to the integrated curriculum project. As illustrated in Figures 1.1. and 5.1., students typically described more interests and abilities expressed in their projects, which occurred after MI Theory application, than were expressed in their regular assignments, discussed in the interviews prior to the MI Theory introduction. The fact that students appeared more aware of their different abilities following MI Theory introduction, may support the study's assumptions that MI Theory is a generative model for addressing student individual differences at the high school level. The increased variety of intelligences expressed in the project work, however, may also be influenced by the nature of projects. That is, the increased references to individual abilities and the development of these may be more a result of some projects' greater accommodation of student individual differences. It should be noted, however, that because the MITA model was developed from documented students' ideas about their awareness of their own individual differences, the model also incorporated their recommendations for further developing these differences. How does this model relate in particular to students' ideas about their subject matter described in this section? Finally, how does the MITA Model help to connect student ideas about subject matter, to the whole project?

The MITA Model, in Figure 4.1, illustrated my incorporation of student recommendations about their high school subject matter, and my own efforts to show the many relationships between the students' ideas and MI Theory ideas about student individual differences. Figure 1.1 (in Chapter 1) illustrated the relationships between student "passions", high school curriculum and MI Theory. Figure 5.1 illustrates one aspect of the students' major projects, by showing the relationships between students' initial expressed interests or abilities, MI Theory, and their final interdisciplinary projects.

Figure 5.1 Relationships Between Student Passions, MI Theory, and Final Interdisciplinary Thematic Study's Projects

Participant	Passion	Reference to MI Theory	Expressed in Project (from initial interviews)
Joe	sports	kinesthetic	did report on sports; showed how 5 sports changed over the years — included: tennis, baseball, football, hockey, and basketball
	computers	spatial	typed his report; showed changing technology in sports
	socials		not related
	linguistic	English	not related
Elaine	math	logical-mathematical	found it hard to relate
	photography	spatial	Burned the edges
	camping	intrapersonal	used diary approach
	teaching others	interpersonal	(no mention of use)
Les	debate	linguistic	related project to debate
	singing	musical	told stories about his music
	intrapersonal	autobiography	wrote a life story
	interviews	interpersonal	asked family stories about his babyhood
Kara	statistics	mathematical	statistics and math courses I took in school
	swimming	kinesthetic	examined family sports
	art	spatial	Drew headings for video
	history	linguistic	Wrote a family history
	drama	kinesthetic	Created a video
	communicating	interpersonal	interviewed relatives
	science labs	intrapersonal	examined fam. occupations (i.e.uncle designed a truck)

Participant	Passion	Reference to MI Theory	Expressed in Project (from initial interviews)
Sam	sports creative ideas art business	kinesthetic linguistic spatial interpersonal	not mentioned interests unrelated to school not mentioned interviewed people
Chelsie	math piano sports reading writing	logical-mathematical musical kinesthetic linguistic linguistic	number of believers 13, 14, & 15 Century built a mockup church Religious History Essay - "The Holy Book"
Cathy	piano socials English Working with people music math	music linguistic linguistic interpersonal musical logical-mathematical	"does not relate" examined time instruments Wrote an essay inventors of sundials "did not relate" "had a lot to do with" theory of relativity how pendulum swings
Keith	sports math science socials art	kinesthetic mathematical mathematical linguistic spatial	showed evolution of sports did not relate to math Science Fiction story originally - do newspaper did not relate to art

Figure 5.1 illustrates a wide variety of interests and abilities expressed by students and some application of these abilities in their final projects. The following section identifies three main limitations of the subject matter typically taught in a high school to accommodate students' different interests and abilities.

As their responses indicate, the students identified three main limitations of their present curriculum subject matter to accommodate their individual differences. First, insufficient time is allocated daily for each discipline. Second, the mandated curriculum drains too much of the students' energy, allowing few opportunities to explore and develop their own interests and abilities. And third, the rigid university requirements do not include opportunities for individual development.

Students generally described subjects that related to "real life" as more interesting now, and more "useful" for their future career preparations. Students also recommended that they should be given more choices concerning what high school subjects they studied. In contrast to Bloom's (1987) claim that high school students frequently do not know what subjects to choose, and should be offered a menu of the classics rather than expected to make choices, the students in describing their projects, identified a wide variety of interests and abilities that they hoped to develop in school. As a group, the students' listed, as indicated in Figure 5.1, all seven intelligences identified in MI Theory. This fact would seem to support the argument in favor of a high school curricular menu that would allow students to develop individual differences, rather than a more traditional disciplinary content.

Perhaps because these were generally strong academic students, they easily reflected on their own abilities, and articulated their expressions of individual differences in class. For the most part, as indicated in Figure 5.1., students expressed a desire to use more than one intelligence in their schoolwork, and an appreciation for opportunities to use a variety of abilities. Interestingly, the intelligences least mentioned by students as useful, were musical and intrapersonal. From the students descriptions of their projects,

they corroborate Gardner's (1992), argument that mathematical and linguistic are the most useful intelligences for most current school-related projects.

Linguistic abilities were mentioned by students on nine occasions as contributing to their projects, and mathematical, on six. Kinesthetic was mentioned six times, and spatial and interpersonal were referred to five times each. Surprisingly, intrapersonal is only mentioned by two students, Elaine, who wrote an autobiography and Kara, who researched her own place in her family's background.

In one discussion about "subject matter", Keith described some connections he identified in his project between math, social studies, English and science.

Ellen: How did you relate it to, um, Math?

Keith: Math? Uh, I just used like 'cause part of science the growth rate?
Where you use a line graph?

Ellen: Yes. How did you relate it to Art?

Keith: Art. Good point. Um, Art, well, (laugh) um actually . . . maybe Art well just imagination. Just imagination of how to having two worlds.

Ellen: Did you do any drawing or graphics or . . .

Keith: I did, just for the title page though.

Ellen: Just for the title page. What did you do on your title page?

Keith: I don't remember!

Ellen: You Don't remem . . .

Keith: Uh, it was quite a while ago!

Ellen: Yeah? Edith related hers to Math and Art.

Ellen: Okay, so it was not necessarily artistic. Did you relate it in any way to um sports, Keith?

Keith: Um, actually how I related it was sort of um is how my life is um what it has evolved from.

Ellen: Of course, so you told about sports in your life?

Keith: Sort of. I just told about events right? But I'm not sure there are any connections in there? Maybe there are but I don't know. Okay, I'm still no where . . .

Ellen: Of course! Of the connections that were made. Did you find it difficult to try and make connections between those subjects? Is that hard for you? Or do the connections just come?

Keith: Some. . .

Ellen: Thank you, okay

Keith: . . . uuh sometimes if I'm heading in the right direction. . .

Ellen: Okay, thank you! Why do you say that if you are heading in the right direction it comes?

Keith: You're just focusing on sometimes you just focus too much on this one discipline and you just ignore the rest?

Ellen: Okay, so you ignore the connections?

Keith: I guess so.

Ellen: Interesting. Thank you. I appreciate that Keith. Is there anything else you want to say about your project?

Keith: . . . um. . .

Ellen: What would it look like if I saw it?

Keith: It's just um a folder and a story.

Ellen: It a folder and a story. How many pages?

Keith: About 22 pages.

Ellen: Twenty-two pages, and how is it broken down? Does it have chapters or ...

Keith: No, it's just one short story.

In addition to relationships between mathematics, science, social studies, and English concepts, some students also described the relationships between their interests and abilities and their high school subject matter.

The students' expressed relationships between their individual differences and their subject matter provided several significant ideas toward the development of the MITA Model. For example, the students indicated the necessity for more collaboration and brainstorming with teachers, through their mention of a wide variety of expressed intelligences and approaches used to complete their projects. The use of interest inventories was included in the MITA model in order to help students and teachers to identify the many student abilities and related approaches represented in Figure 5.1.

The MITA Model addressed the students' concerns about subject matter particularly in phases three and four, as illustrated in Chapter 4. In phase three, the recommendation to introduce *MI Theory*, provided students with an opportunity to identify their own abilities and to outline any perceived weaknesses. The recommendation was also intended to enable students to suggest activities which would be associated with each of the seven intelligences.

Phase four of the MITA Model, on the other hand, explored the use of an interest inventory in order to identify representations of subject matter emphasis the students may select. Because each of the segments of interview text included in this chapter, in one way, related to subject matter, no further specific examples are cited here. Finally, as illustrated in Figures 1.1. and 5.1., the students identified all seven intelligences within MI Theory.

5.7 Students' Perceptions of the Role of People in School

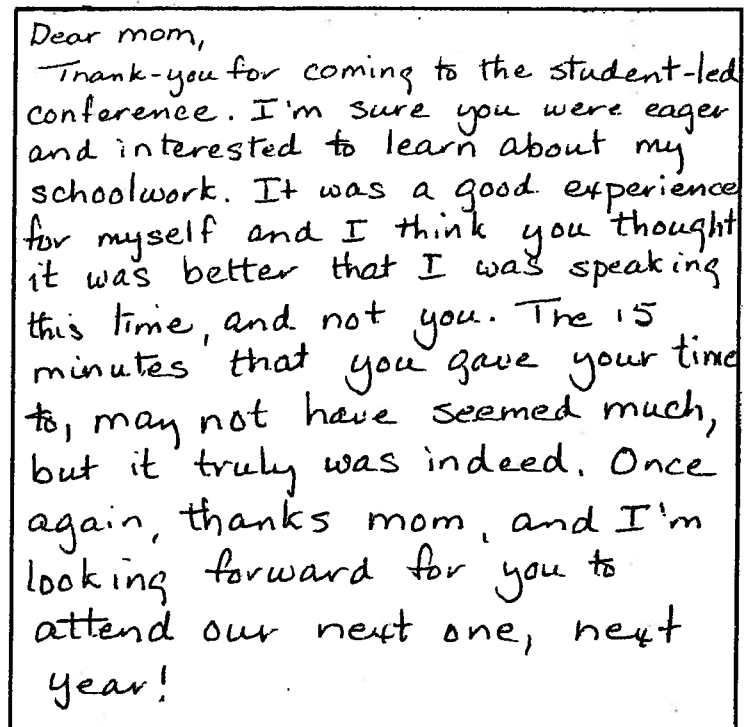
Concerning **people**, the students showed appreciation for what they typically described as the caring community of teens at their school, and expressed a desire for more parental involvement . Regrets were at times expressed by some students that through lack of communication between the school and home, parents did not always know what was expected at school. For this reason, according to Kara, their parents at times could not offer needed assistance that would otherwise have been available. Kara extended the notion of increased involvement to grandparents, and expressed the desire for more contact between teens and the elderly community.

The fact that friends, were so highly valued by these teens, changed the direction of my investigation, to include the relevance of students' friendships. Joe, Les, Chelsie, Cathy, and Keith described their friends as significant contributors to their acquisition of knowledge. Keith spoke of the friendly competition provided by peers that keeps him on his guard academically.

After friends, parents were considered the most significant people in the students' learning process. One important area in which students expressed interest and enjoyment in parental involvement, was through student-led conferences. Letters following up on

these conferences were published in the January School Newsletter, and are illustrated in Figures 5.2. to 5.4.. Joe suggested the schools need to provide "more and more conferences involving the parents." The following letters written by students and parents indicate the level of meaningful interaction involved, and show the students' enthusiasm over leading these conferences.

Figure 5.2 Examples of Letters Written by Parents and Students



Dear mom,
Thank-you for coming to the student-led conference. I'm sure you were eager and interested to learn about my schoolwork. It was a good experience for myself and I think you thought it was better that I was speaking this time, and not you. The 15 minutes that you gave your time to, may not have seemed much, but it truly was indeed. Once again, thanks mom, and I'm looking forward for you to attend our next one, next year!

Figure 5.2 Continued:

Dear Mom & Dad,

Speaking on behalf of the school and of myself, I would like to thank you for coming to the student-led conference. It was your presence that made it possible. The conference was a great success. Everyone participated and we all had fun. Hopefully you did too. The goal was to communicate & I thought we communicated very well. I told you my goals, achievements & failures & you responded back with help. Leading the conference was a personal achievement. Thank you for your time & cooperation.

Dear Son,

It's a joy to be around you as you derive so much pleasure from your projects, accomplishments etc. Please don't go so fast that us ordinary folks can't keep up! Keep up the great work! Most of all keep sharing with us!!

- Dad

The conferences from which these letters were generated are held once each year. The students invite their parents to the school and then discuss their progress, using examples of their works and major projects in order to show and tell parents what they have learned. Figures 5.2. to 5.4. were selected as examples of the exchange of letters between students and parents, following their student-led conferences.

Kara described how there should be more such exchanges. She told how her parents and grandparents really wanted to help. Kara's dad did not understand all the subjects they studied in school, but helped her to get organized since this was his strength. He taught her lessons in organization that helped her to do well in her school work. Kara expressed concern for the way our generation ignores the talents and abilities of older people, and showed her ideas of how they should be invited to become a part of schools. "I think I'd like to get the older generation in, you know? Like our family is very close to our grandparents but I know a lot of other families where you know the older people are sort of left . . . unregarded . . . like just sort of kids to be babysat. . . ."

Students typically named their parents as the most responsible for "what you learn in school", and several students indicated a desire that parents become more involved in curriculum issues. I had expected the students to choose between teachers or themselves as most responsible. Their strong mention of parents' contribution was particularly surprising, since it was not anticipated in my interview questions. Yet students directed the conversations in this way, and named parents and even grandparents as significant players in the educative endeavor. In addition to friends and parents, older people have a great deal to offer teens, according to Kara, and they would enjoy the challenge. "They have a lot to offer. And they love young kids. If you go up and say hello to them . . . and you know . . . they really enjoy that. . . ."

In the way schools are presently organized, however, parents or grandparents have few roles. Chelsie put it this way: "I don't think the parents do that much unless they join the parents' association or something . . . but no . . . they don't really do that much. They just give suggestions maybe. The students suggested that parents should be much more involved in the critical issues and "educative" environment at school, the everyday meaningful activity at school, as opposed to only after school fund-raising or extra-curricular activities.

Interestingly, while students identified the significant contributions of parents and community members toward their high school education, they either did not mention the principal's role, or could not identify what that role was. The only person to directly mention administration's role, Chelsie added: "And the principal? Frankly I don't know what the principal does?"

5.7.1 Students' Responses Concerning the Roles of People

The MITA Model addressed the students' concern for increased parental involvement by recommending, *that parents be invited to contribute ideas* to the curriculum planning stages (in phase 6), as well as contribute ideas about the students' interest and abilities. Further communication between parents and the school community was recommended in phase 9. Here students thematic *projects would be displayed* for parents' viewing. The idea was that parents and students would interact concerning the projects.

Kara's project illustrates her choice to involve parents and family members in her school work. In Kara's words:

- Kara: Well, okay, uh my first one was the main one. It was a family history sort of. It was to show change throughout the generations of my family and doing this, uh, first I had like about ten topics, but then uh I narrowed it down to about one, which was occupation. Then I chose, I got into the occupations of like my family members from . . . I think I started at my great great grandparents, my great great greats were mentioned once or twice, and then moved up to to my generation and how occupation has changed and through that I showed like how the lives have also changed because like you know there's lots of different like aspects of life that can be incorporated in. And I did a movie on it, so . . .
- Ellen: What do you mean you did a movie? Can you tell us a little bit about that?
- Kara: Well I filmed . . . basically it wasn't actually it wasn't actually like a acting one 'cause I didn't get, have enough people that I was working with, but uh I drew some or a lot of the introductions I drew diagrams and different symbols like fer you know for parts of . . .
- Ellen: You drew them?
- Kara: Well, just the introduction part.
- Ellen: Great. And then did you have a video? Or is this from the drawings.
- Kara: Well, no, yeah, no it's just that on the video. Like I filmed the you know the thing that I put on and put music behind it.
- Ellen: And then did you have people on the video as well?
- Kara: Um, I had, mostly I had photographs and I got (laughs) some from my grandparents house, and uh, looked through boxes of of stuff, and arranged them like I was telling you. Um, for instance, one of the struggles was I bought um well like my great grandpa used to work painting cars, so I had a little toy car and I filmed that as I told it and then different . . . it was all done but most of it was done on different pieces of material 'cause we've all got different plaid 'cause we're Scottish and English so you know, most of our roots go back there. Laid out, you know with the different, the different like um dolls. I used dolls for human figures and a lot of photographs too.
- Ellen: Did you enjoy doing it?
- Kara: It was fun, yeah.
- Ellen: What was the part . . . what did you enjoy relating it to the most?
- Kara: Ummm . . . mmm . . . I'm not sure, probably well the easiest to write was the Socials and um I guess yeah Science was pretty easy to, but like you know it's it's easy to find the subjects in it, but to show how they interrelate like around a certain subject is really difficult.
- Ellen: What is the hardest one?
- Kara: ummm. . . I'd have to say probably Math.
- Ellen: Math.
- Kara: I did there's lots of there's lots of instances where Math occurs with applications and stuff, but just like there's not like enough you can make anything with it? There's sooo much English and Socials, you don't want to leave Math totally out, and yet you can't like go you know my parents had like children and it's like two kids plus one equals three or something you know! (laughs) You get really desperate at times!
- Ellen: (laughing) They have four chairs and three bedrooms in their house and . . . four flies flew in!
(both laugh)

Kara: That was so (intelligible words) but . . .

Ellen: Did you did you have other people in to help you? or did you do it pretty much on your own . . .?

Kara: Um, no my family was . . . uh

Ellen: All involved!

Kara: I have all my grandparents on tape and got them to tell me uh stories about the occupation of their parents and um that was the part I enjoyed the most, uh, I found different things out from looking at pictures. I spent a lot of time that wasn't about the project just going through old photo albums. It's really interesting.

Ellen: Did they like talking about their past and their careers and . .

Kara: Well, yeah, yeah they liked they like helping me out right, so I just got tons of stuff from them and then . . .

Ellen: Excellent, so would you do that again?

Kara: Yeah, I think I'd Like to, but I don't think I'd like to do it a little bit more, to do I don't think so much like so much occupation, like I'd rather do it more rounded sort of how life changed, but it's hard without specific You know, I'd like to get more into the personal part of it.

Ellen: I see, I see, rather than just . . .

Kara: Yeah what the people are like 'cause it's very interesting finding out about where natures and stuff, you know . . . my grandpa was an artist and he was very withdrawn and sometimes if he didn't want anyone to come to his house he when he saw his friends coming up he would put all the shoes outside so they would think everyone was there and they would go back down the mountain! But it's hard to incorporate that into I think I'd like to do over.

Ellen: I see. How did you how would you be able to relate it to um to swimming say? And to some of the things you like? You relate it to Art and Drama and communicating and . . . and why was it easy to relate to Science?

Kara: Well there's actually a lot of things um to do with occupations because if my well my grandpa worked in forestry so it was easy with the cutting of trees and and he also was a a lime shipper, so you know how they, how they process the lime and then you know how they shipped it actually there was some science in the way they designed the trucks, which he sort of designed a new type. They never used to have you know tops on them?

Ellen: Yes.

Kara: So the lime would be like every time they stopped, the lime would come flying out, right in! So he said well you should put tops on! And stuff like that. You know just . . .

Ellen: So did he invent lids for . . .

Kara: Well . . . he didn't really but he suggested them and how to put them on 'cause . . .

Ellen: Okay, well that's an invention in a sense.

Kara: Yeah. . .

Ellen: Thank you. So is there anything else you want to tell us about your project? So it came in as a video tape.

Kara: Yeah, well I also had a rough copy which I'd written out everything that I'd said. 'Cause I narrated the whole thing. I had it playing on a tape behind where I was filming? So I was like narrating with music so um . . .

Ellen: So you transcribed that on paper.

Kara: And that it was really rough. I don't that's one thing I wish I could have had time to do is print it all up 'cause that was where I showed my connections. Each subject was a different color and I used arrows and little words.

Kara enjoyed talking about her family, and her close family ties. To include her parents and grandparents in her work, for Kara, was to include an important part of herself. Again and again as we talked, she illustrated ways in which her parents added to her success in school. She indicated here that by focusing on her own background in a project, she would enjoy learning more.

5.8 Summary of Student Responses to the Research Questions

The three most significant themes in student responses regarding the five foci presented, were **time**, **friends** and **parents**. Of less significance were the themes, **authority** and **subject matter**. Students identified the time shortage, which they attributed to being an outcome of too much curriculum. They made a plea for increased opportunities to work with peers in order to experience peer support. Finally, students suggested that their parents be permitted greater involvement in their education. These students did not exaggerate the current constraints of their high school curriculum, and generally appeared to be well-adjusted and happy in school. But they were surprisingly agreed on several recommendations to improve the curriculum. Their suggested improvements included: more time in class for individual development; more peer interactions; more relevance to the real world; and more parental involvement in school activities.

As we will see in Chapter 6, students' perceptions differed dramatically from their teachers' perceptions, especially concerning the issue of student authority or responsibility over their own learning. For example, the students attributed much more

authority for learning to their peers and their parents, rather than to just themselves or their teachers. Chapter 6 describes the teachers' perspectives of the third research question: "What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model?"

CHAPTER 6: TEACHER PERCEPTIONS OF SCHOOLING AND STUDENT ABILITIES

6.1 Introduction

Chapter 6 presents the research results, from the data collected through the discussions, interviews, and group meetings with the teachers, including about 30 hours of curriculum planning sessions. The chapter describes the teachers' responses to the third question guiding this work, "What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model?" Because the main focus of this study was on students, I am using the same categories here as I used in the student data analysis. That is, teachers' perspectives concerning, use of time in high school; the role of friendships among students; the cultivation of student autonomy; the relationship of high school curriculum to the real world; and, the involvement of parents in curriculum, are presented. This chapter, like the previous one, is divided in five foci or sub-sections: time, space, authority, subject matter, and, people, in order to present the teachers' responses to the third research question. Before undertaking the analysis, however, I will examine the teachers' perceptions of MI Theory and its application to curriculum development.

6.2 Teachers Respond to Research Question Three

The third research question concerned how did the teachers view the application of the MITA Model, in relation to their current practice? It should be noted that both the teachers and students contributed to the construction of the MITA Model. At regular intervals, as the model developed over ten months, I provided diagrammed copies of the model's progress to all teachers. In addition, I responded with print copies of our

collaborative efforts following each development meeting. Either I would sketch my interpretation of the teachers' contributions concerning the model, or write out the comments made. After each session, these feedback copies were placed in each teacher's mailbox at the school. Samples of my correspondence to teachers are located in Appendix F. It was not always possible to communicate sufficiently on the model's development. Due to a teacher's strike, and the many time restrictions of the participants, the teachers, for example, were unable to evaluate the MITA Model's use following the teaching of the interdisciplinary units. Discussions were held weekly with teachers, however, during the model's development, and teachers' verbal input was significant during this ten-month period.

There were several limitations encountered in obtaining appropriate data to address the question adequately. In addition to interruptions from the strike, the teachers' responses to the MITA Model's development were limited by another significant factor, namely, the MITA Model was not used in a similar manner by all four teachers. Specifically, one teacher did not use the MITA Model as he was previously committed to another approach to curriculum development (Perceptivism) and he did not view the two theories (MI Theory and Perceptivism) as compatible.

6.3 Teacher Perceptions of the Study's Curricular Initiative

In order to establish a context for the teachers' responses to the curricular initiative we first examine their perceptions of: (a) MI ideas; (b) the development of student individual differences; and, (c) the traditional constraints of high school. Teachers' perceptions of each of the three topics are presented in the following sections.

6.3.1 Teachers' Perceptions of MI Ideas

The four teachers were provided opportunities to discuss their perceptions of MI Theory ideas during three in-depth interviews. Questions asked in the initial interactive interviews are filed in Appendix B. The teacher-generated questions that guided our second interviews after two months of working together are listed in Appendix A. Finally, after nine months working together, teachers were interviewed regarding their perceptions of the process and the usefulness of MI Theory as a generative Model for addressing student interests and abilities. In addition to the three interviews, we held at least twelve large and small group discussions, that lasted anywhere from one to three hours each. My responses to teachers during these discussions are found in Appendix F, and the visual materials I supplied from our discussion for use in classroom introductions are found in Appendices G and H.

In part, the teachers' responses to MI Theory were also expressed in their description of the methods by which they presented MI Theory ideas in their classrooms. Mark, the head teacher, for example, after a presentation of MI Theory in his social studies class, asked the grade 10 students to graph their assessment of their own abilities on a chart, and to respond to several written questions concerning the theory. Mark, also discussed with the students: the different intelligences they hoped to develop; the areas of perceived growth from childhood; the development of additional intelligences and interests; and, students' view of the intelligences most developed in teachers. John and Joanne both expressed their intention of applying MI Theory to curriculum development more in the coming year. Bob, on the other hand, did not see the usefulness of MI Theory in teaching mathematics, and consequently did not discuss MI Theory with students.

The teachers differed significantly, in their perceptions of the usefulness of MI ideas in the high school classroom, from Joanne's claim that the seven intelligences were already evident in a "good classroom", to Bob's statement that, "these are not very useful in teaching math." John and Mark both introduced MI Theory to students in class, used the theory in order to identify and discuss more student abilities, and worked with students to help them develop and express more of their seven intelligences. It would be necessary to revisit the research site in a year or so, following a more lengthy trial with the MITA Model, in order to determine whether there were any lasting effects.

6.3.2 Teachers' Perceptions of Individual Student Differences

The notion of student individual differences was discussed with the teachers throughout the study. Following a group discussion on the idea of fostering students' individual differences, the teachers suggested three main recommendations for addressing individual differences adequately. Firstly, there was an agreement from all four teachers that students would benefit by "getting beyond" the curriculum. Joanne, for example, referred to projects that "get past the curriculum" and spoke of ways that she helped students to "value their own opinions". When students valued their own opinions Joanne suggested, they "use their own ability to look at things". Students confirmed this notion, when they talked enthusiastically about collecting beetles for observation in Joanne's class, and of conducting experiments that were not in the textbook.

Secondly, there was an attempt made by teachers to provide as many choices as possible for students. In order to do this, John, told of negotiating with his class the dates for project completions, and also encouraging a wide range of student responses

to each question. John emphasized, "We are trying to make them think individually." In fact he stressed his own discomfort when students, "ask me for the right answer."

Mark spoke of a "shared responsibility" between the teacher and the learner, where the students have some control over what they learn. He described how he built a foundation for a history course, and then required that students choose one segment of the historical period in order to teach the class. As an illustration of this, Mark said:

. . . in grade 11. . . I've taken the students historically from 1867 to approximately 1940. Now it's up to them to carry on. And they've decided in groups that they are going to teach according to a decade. . . so there'll be the 50s, the 60s, the 70s, 80s, and 90s. So it's up to them how they will teach me about these periods. . . it's a shared responsibility.

Thirdly, teachers spoke of cultivating an environment where students could make individual choices. Such an environment differed significantly, however, from one teacher to another. By way of illustration, in mathematics, it appeared significant to place students of similar interests and abilities together, in order to provide choices for students. Bob expressed a concern here, that mathematics' classes should consist of students of similar interests and abilities. According to Bob, "If we have every imaginable range of interest and ability in one classroom, that, it would seem to me, would be total chaos. Students couldn't make choices."

In science, Joanne argued, "Science is not something you can put in a box." While Joanne expressed concerns over the restrictions imposed on her by the mandated curriculum, she spoke of ways to get students past the curriculum, and into an environment where they could experience many differences. One way in which this was

done, was a requirement for students to use a wide variety of other people as their resources in science. These people, according to Joanne should include, "the person next door who happens to be a chemical engineer, or a bus driver, or a person in the supermarket," all of whom would provide students with an ability to communicate their understanding of science topics and to develop a variety of perspectives.

In English, John also referred to a wide variety of outside resources in order to provide students with a greater number of choices. Some of these outside resources included writers from the University of British Columbia writer's program. John also spoke of inviting parents into class as guest speakers suggesting that they would "provide a valuable resource". On the topic of providing more choices for students to develop individual differences, John said: ". . . no matter how much we individualize, I wish we could individualize more."

6.3.3 Teachers' Perceptions of Traditional Constraints of High School

The teachers' responses to the interview questions in Appendix B showed their concerns for several current curriculum constraints, such as time constraints. Each of these teacher concerns is explored further in one of the following five sections.

Throughout the study, the enhancement or impediment of the conventional curriculum structures in high school was discussed, as these structures were perceived to enhance or impede the development of individual differences. On this topic, the teachers identified lack of time and too much content, as the greatest barriers to individual student development, in their current setting. They frequently made reference to these two as barriers to the development of students' individual differences. In this segment from the second interview, I asked John to tell me more about the mentorship

program that he spoke of developing in his class. In response, John expressed frustrations about time barriers, and a teacher's difficulty in covering the content material. Similar frustrations arose with the other teachers:

John: Well, it depends which face . . . Some of them were the rotary club, volunteers who were interested in doing. . . . being mentors. And that was . . . I was sort of coordinating that with the whole school - not just the mini-school. Before I came into the mini school, and then for a year after. And then it was felt by the staff that the Autonomous Learner Model version of mentor is different than that. It was built around student passions - so we needed to identify student interests and help them to enter into a field of their passion.

Ellen: Yes

John: Um . . . which we've found very very time consuming.

Ellen: Yes, of course.

John: Um . . . we've had some successes in two or three cases. We wish we had more time to make more of that happen. I just read an article about a lady at YMCA . . . at YWCA . . . who has matched 35 kids, she mentors.

Ellen: Oh.

John: And I wonder if she has some secret to do this and I wonder what else she is doing? If she's also teaching full time English or . . . ? Or what she's doing? Or if this is a half time job. . . . it's a little bit like career prep . . . you some people have a half time job . . .

Too much time in the present system, according to John, would be required to accommodate student individual differences. Yet, like John, all of the teachers recognized the necessity of developing student individual interests and abilities. The sense was that, "if barriers did not exist we would concentrate more on individuals." But, as evidenced in John's words, within the present system too many barriers prevented this concentration, according to teachers.

In contrast, the greatest enhancement currently to individual development, according to the teachers, is space (since it can be altered by students and teachers) and people (since guests can be brought in as rich resources). On the matter of authority, teachers provided fewer comments and these could not be easily construed as either an enhancement or an impediment.

6.4 Teachers' Perceptions of the Use of Time at School

The teachers were generally in agreement that the lack of time to cover important concepts, or address individual student differences, was a major constraint to current high school teaching. John suggested that in order to overcome this problem, he ". . . often schedules meetings with students after school." Mark suggested that it is difficult to assign time to his average day, since he breaks up time with seminars, debates, and a variety of activities, stating that he allows "about 15% to 20% for the development of individual differences. As illustrated in the interview segment below, Bob stated that "you can get through that" and get onto other things, referring to the time it takes to "get through the mandated curriculum", in order to create time for the development of individual interests and abilities in mathematics.

Bob: Well, one of them, of course would be the ability to ah . . . to do the required core work. . . which involves a lot of calculation and so on . . .

Ellen: OK. So maybe long chains of reasoning?

Bob: Yeah. Yeah. with different procedures whether it's factoring or dealing with the basic algebraic operations. . . um . . . multiplication, division, addition and subtraction, and so on. . .

Ellen: Uh hum.

Bob: Um. . . working in coordinate geometry. Um. .. you know. ... XY plane and getting equations mapping them with graphs. Looking at graphs and getting equations for them. . . probability and statistics. . . calculations and so on . . .

Ellen: Uh hum

Bob: That would be basic sort of things.

Ellen: Yes. So how much time do you spend on these kinds of things?

Bob: Well, it depends on which class it is. If it's a mini-school class, you can get through that and get onto other things.

Ellen: OK. What other things would you get onto, Bob. . .

Bob: Well, we try to work on applications, is one example. And try to look for instances in other subject areas where uh. . . the ideas apply. You know, like taking concepts from mathematics and seeing how they're used in Science, for example.

Ellen: Oh. That's interesting. . . Can you describe how you see time divisions in your one hour block in a mini school math class. How would you describe the allocation of time to . . . to big areas. . . for example?

Bob: Within any hour. . .

Ellen: Yes. . . within any given hour for a mini school class.

Bob: Well it roughly divides into three. The beginning third of the class there's some sort of introductory work that ties to the work before

Ellen: Hum.

Bob: Or that works on some idea, and they have to do something right away.

Ellen: Yes.

Bob: And that gets their books open and um. ... gets them doing something. Then, in the second third of the hour there is some sort of activity where we work on something new.

Ellen: Uh hum.

Bob: . . . and . . . ah. . so either I introduce something or I give them something to do that develops a new idea.

Ellen: Uh hum.

Bob: And the third part of the the class they practice it, either individually or. . . . working with each other. A lot of the times they work with each other.

Bob's suggestions for how to handle the "lack of time" problem, as suggested in this interview segment, were very different from the other three teachers. Basically, Bob felt that he should work students hard "to get through" the prescribed curriculum in order to do "other things". Joanne's students also expressed frustration by the lack of time. These students described how they enjoyed lively discussions or cooperative activities, but did not like the bells that cut this work short. For example, when students were asked to work with one another in pairs to solve a problem or to develop a variety of individual perspectives about an issue, they typically commented that they would be at the peak of their discussions, and the bell would inevitably ring. As Joanne put it:

. . . part of the problem of course is that we are limited to one hour.

And sometimes you've got people working together or there is a cooperative group going on . . . they work in one group and then they shift to another. It's just flowing, and the ideas are starting to come, and we're brainstorming, and the darn bell goes. It would be nice to have flexibility, when things are moving along.

Teachers not only expressed concern for too much curriculum to cover in too little time, but they recommended a variety of solutions. These included, "breaking up time segments with a variety of activities," "meeting students after school to work on individual development issues", "using the curriculum as springboards, rather than as an end product". One teacher spoke of seeking ways to avoid being "bound by time", and another spoke of "getting through" the mandated curriculum so you could get "on to other things" (such as the development of individual differences).

Were the teachers describing here a basic difficulty within the current high school system? According to Brown (1991), their frustration with inflexibility is based on the systemic imposition that forces teachers and students to "keep on schedule" (p. 237). Time, according to Brown (1991), "is also a function of what is called coverage, the second most frequently given reason why there is not more thoughtfulness in the schools" (p. 237). Both students and teachers expressed the concern for what Brown describes as " . . . they must cover an already sprawling and constantly expanding list of topics within and across subject matter areas" (p. 237).

6.5 Teachers' Perceptions of the Use of Space at School

On the topic of space, teachers sometimes expressed a desire for additional room and, as Mark said, "a few couches and a rug for students to get more comfortable," They mentioned including more tables for students' group activities, and bringing computers into the classroom. Mark also stated that space was not really a problem, since he liked to get students out of the classroom whenever possible, "in order to experience richer environments." Although Mark indicated he would transfer his

classroom into more of a museum if possible, he described how he does not allow the space restrictions to detract from his Social Studies program.

Ellen: Will you talk to me about space? Um . . . Would you describe the classroom and meeting place for Social Studies?

Mark: Well the world is the place I would begin to give you an appropriate answer. Um . . .

Ellen: And that is appropriate.

Mark: Um . . . I don't think I could define the learning space, or the appropriate learning environment as my classroom. I don't think I would have achieved again my educational goals. Mine is to make the students a global citizen. And to become a global citizen you have to be . . . try to be aware . . . of all the events that are going on. Obviously there not. . . . because of the age that we live in of technology and communication and Marshal McLuhan's global village concept . . . That's something I want to try and promote in the classroom.

Ellen: Then I'd like to get at that from a different perspective. Do you think that the meeting place that you have within this school is adequate to accommodate your global perspective and if not, why? And if so, how?

Mark: That's like asking for a wish list. Um . . . No . . . I don't think it's appropriate. But it's the only area that I have to deal with right now.

Ellen: Why isn't it appropriate?

Mark: Ah Lack of visual aids, I think. Lack of technology at my fingertips. For example it would be nice to have. . . Well we do have a satellite in the school, but because of money it's not working. But I would like to have ready access to the satellite hooked up in my classroom for example the inaugural speech that was going on just boom - (Claps fist into hand) put it into my classroom. The Iraq, Persian Gulf issue. . . right into my classroom where we could discuss it right away. But as educators sometimes we're bound by the curriculum not to allow that to take place. But we do have for example, we do go to . . . try to not focus too much on grade 11 here. . . with the grade eights . . . we'll go to temples for comparative Religious studies. So that is part of the classroom.

Ellen: So you have quite a few field trips for Social Studies?

Mark: Not this year . . . but I do in grade ten we'll go to Victoria. And rather than read about Victoria, we actually focus on a unit in British Columbia. And we actually will go over to Victoria, like Ross Bay Cemetery. And we'll have a tour of the cemetery. We'll go to the legislative buildings . . . an introduction to government. We'll do a tour of Victoria for a historical overview of Victoria . . . its economic, political, social significance in comparison to the rest of the mainland. So I prefer to do that. And that's when I said to you earlier - relate to life.

Ellen: Yes. . . yes.

Mark: And that's . . . relating to life, I think in the nineties is so important because of what the students are faced with in the sense of the media. Ah . . .

Ellen: Yes. Would you say that your meeting place for Social Studies is very different or does it compare to across the city say. . . high school social studies classroom. How is your environment different or is it the same? The place that you meet in. . . .

- Mark: I think it's a frame of mind actually. I mean a room is a room. You could say for the social studies class here compared to Dal's or Fong's or others it's a room that's a dimension of 30 by 30. . . .
- Ellen: And that it's similar?
- Mark: I'm sure it's similar. I mean I haven't been to all the social studies classrooms. . . But I think it's what takes place ah. . . and the interaction between the teacher and the learner, and the wealth of knowledge. And the concept of knowledge being power. Power is knowledge and I think that's something I would like the students to be aware of . . .
- Ellen: Is it fair for me to say from your statements earlier that to improve the environment that you have now. . . technology and the freedom that technology would bring you would be a major improvement that you would like to . . .
- Mark: Un hum. It would be an asset . . . I don't know. it would be a tool.
- Ellen: If you could create an environment where your students . . . if you could design it, what would it be?
- Mark: If I had control of the curriculum? to do that?
- Ellen: Yes.
- Mark: It would be more field studies. More than I do now because I
- Ellen: So you'd keep your room the same?
- Mark: I'd keep my room . . . good question. . . .I never really . . . Would I keep my room the same? No . . .I might change my room. . . Yeah . . .I would change my room.
- Ellen: What would it look like?
- Mark: What my room would look like? It would have a couch. It would have. . . . a reading centre. It might have an telephone, an old telephone booth in it. It might have a . . . it would have projects in it that students are currently working on . . . It would . . .have um . . .
- Ellen: More like a museum, then ?
- Mark: Yes. Yes, some kind of a museum. It wouldn't look like what it looks like . . . Well . . .

The above segment shows how teachers typically described space in an external context. As indicated by Mark's comments, space to the teachers meant either physical environment or external objects. The teachers responded to this question of space, usually by describing their working areas, and identifying objects they would add to or take away from this environment to improve the learning conditions.

Joanne suggested that the current science room, where large counters were fixed to the floor made it difficult to group students for cooperative projects. She favored lighter, and movable tables in order to allow more flexibility for students to move around.

Bob suggested that his classroom with movable desks, was adequate for teaching mathematics.

The teachers responded more directly to the actual physical space in contrast to the students' emphasis on personal friendships here. But indirectly teachers did refer to, and give examples of group activities that would cultivate peer support groups. These are explored further in the next section.

While the teachers all expressed a willingness for providing an environment in which peer relationships and group interactions are cultivated, none directly stressed the significance of friendships to learning. No teacher raised the issue of friends, here, as did students in every instance, but when they were asked about friendships, they referred more to the collaborative groups than to individual support or encouragement. Teachers spoke, for example, of grouping students whenever possible in order to brainstorm for ideas on a particular topic. Teachers generally spoke of peer relationships in a different context, relating the groups more to project outcomes than to the individual student relationships that emerged.

Indirectly, however, the teachers' resolve to foster interactive and collaborative groups, at times surpassed the students' requests for peer interactions. Joanne, for example, said that she regularly "mixed kids up" because students often appeared reluctant to work with students of the opposite gender." It should be noted here that the problem of "too much curriculum" at times also significantly influenced the amount of time designated for groups, friendship supports or individual differences.

Finally, while the teachers frequently referred to "outside resource people", the students talked more about their peers and parents as resources. The teachers talked about how these outside resource people were brought in to provide students with a

"greater number of choices" (see section 6.3.2.). Yet none of these resource people were mentioned by the students, a fact I found surprising.

6.6 Teachers' Perceptions of Student Authority in School

Teachers expressed their desire to encourage students to take more personal responsibility or authority for their own learning in different ways. John spoke of planning teaching activities for critical and creative thinking where he described how the students were encouraged to question the author's intent and to develop creative activities such as write a modern version of "Romeo and Juliette". Mark repeatedly referred to the students as partners in learning, and spoke of choices they were given to decide their own project topics. He and John also described classroom scenarios where the students made daily decisions in a democratic way. For Mark these decisions were mainly based on project themes and methods of displaying projects, for John they also included daily shared decision-making, such as dates for project completion and who would work together on group projects.

Joanne described her attempt to extend teaching and learning beyond the curriculum. She suggested that one way to get students to look beyond the curriculum is to use persons as resources, rather than limiting your subject matter to the textbook, and to help students to trust in their own ability - "to value their own opinion." As illustrated in the interview segment below, Joanne, used students and other people as authorities to supplement the science textbook in the same way that Mark used global space to expand his social studies' curriculum.

Joanne: And what I try and do is let them know what I know about the thing. But what is the hardest thing I've discovered, is getting them to value their own opinion.

- Ellen: Yes. Because they are not used to having their opinion valued?
- Joanne: Well no. It's not that. They think that they come into school, and I'm there to teach them science. Now, I can teach them some of the formulas or I can direct them into some of the . . . Um . . . people don't use other people as resources enough. And they don't use their own ability to look at things.
- Ellen: Who do you mean by other people? People don't . . . do you mean the community?
- Joanne: When you give students a research project, where do they go? They go to the library. They go to the . . .
- Ellen: Oh . . . I see
- Joanne: But don't think to ask the person next door who happens to be chemical engineer, or who drives a bus , or . . . um . . . you know . . . the person in the supermarket, or . . . they don't feel that . . . for instance university professors are accessible to . . . (bell rang)
- Ellen: Yes.
- Joanne: So they don't use other people. They don't use their own ability to observe as a valid thesis.
- Ellen: Very interesting. Um . . . what do you think is the extent of the students' authority to develop their own uniqueness in your class.
- Joanne: It's not as much as I would like it to be. Um . . . I mean it's limited by . . . sometimes by the fact that we have a mandated curriculum and many of the students are bound by that. We are bound by that in a sense that . . .
- Ellen: How many students do you have?
- Joanne: It varies. The smallest science class I have is 18. Uh . . . the biggest one I have is . . . uh . . . 29.
- Ellen: Em.
- Joanne: That's a lot. And that may not be a lot . . . depending on who . . . you are looking at such a range of people. Some of them like to share with others . . . some of them prefer to work on their own. And so we have . . . what we try and do is allow them time where they have to share with others and time where they can work on their own.
- Ellen: You have some very valuable ideas . . . I can see that . . . On the topic of people . . . What people contribute most to your science class?
- Joanne: I'm not sure I know what you mean.
- Ellen: Other people, other than the students and you.
- Joanne: Other teachers, not just science teachers.
- Ellen: That's unusual for high school. Isn't it?
- Joanne: Well . . . That's part of my nature. is that I work best with other people. Give me an idea, and on my own I can come up with 5 things, and with somebody else I can come up with 10.
- Ellen: How would you describe your role?
- Joanne: I acknowledge that I am a knowledge base. Um . . . it's funny . . . sometimes I'm the person who keeps them on track. And sometimes I'm the person who pushes them away from the obvious. It depends on what we're doing - or who it is.
- Ellen: Who else would you ask to participate in your program in order to develop your students' individual differences?

- Joanne: I . . . like to bring in people from the Science World, as in universities, people who work in breweries, you know. . . . There are other teachers in the school who I think are really . . . um . . . There is a big commitment, you know . . . to a program like this.
- Ellen: Yes, I know.
- Joanne: People have given up a whole day to help us work on the assignment.
- Ellen: Yes.
- Joanne: I'd like to bring in people from the elementary school. I would like to bring in elementary students. Elementary students often know more science than high school students.

Joanne frequently referred to the students and other people as part of the classroom curriculum. She described here her attempts to encourage student authority in meaningful ways, by providing people as resources for students to observe and learn from. Interestingly three teachers, Joanne, Mark and John, expressed a similar desire to give their students even more authority, in order to create more student responsibility for choices and outcomes of their own learning. The teachers appeared in one sense, to be caught between the desire to increase student empowerment and the desire to fulfill professional responsibilities. As John said: ". . . each individual is most responsible for their learning; but in the sense of the Ministry and the law, if you like and my earning my money, and my professional responsibility, I feel responsible. And I think I probably am, contractually." Other teachers mentioned the tension between providing students with authority over their own learning, and meeting the demands of the curriculum that teachers are responsible to cover.

Teachers, for the most part, argued that students appeared reluctant to assume more authority for their own learning. The limitations of too much curriculum to cover, sometimes restricts teachers from extending more student authority, according to two teachers. Mark, defined what he called, "a shared responsibility", between the learner and the teacher, which he has tried to cultivate. Bob, as previously discussed, suggested that

one can give students some choices, but states that "if we have every imaginable range of interest and ability in one classroom . . . it would be chaos."

Two teachers in the study expressed the desire for more "shared responsibility" with the students. In order to increase student authority, teachers suggested four general strategies. First, collaborate with students and give them choices where it is possible. John explained: "I try to give them a choice about something with every activity. If it's not the content or the topic, then it's the process, or the group arrangements, or the number of people working." Second, help students to view their world in different ways, so that they will grow confident in their own perspectives of issues. Third, teach students and help them to participate in a sense of shared responsibility with the teacher for their own learning. Finally, to remove the sense of certainty that accompanies a search for "right" answers and to cultivate an environment where students are not afraid to take risks. John explained it this way: ". . . let them know that as Northrope Fry says, '*There are no right answers, in literature, there are only well defended options*', that ultimately the notion of authority is a problem". According to Candy (1991) students require such autonomy if they are to acquire the abilities to become lifelong learners.

6.7 Teachers' Perceptions of Subject Matter in School

The teachers appeared to be especially aware of a need to make subject matter apply to the real world. As Mark argued: "always relating it (subject matter) to now is so important." He added, "Otherwise the students don't see the significance." Mark gave an example of how this relationship between discussions in class and practical life in the real world takes place. "Like we talked about the Japanese community and I wanted to compare it to the Holocaust and to the Jews, but then also to the Kingston Affair. . . .

let's talk about the charter now -- let's talk about the Myer Indians. So you've got the kids moving all the time with their minds and thinking about it . . .relating to life . . . and how it might have been different. These are the kinds of questions that we pose."

In his Social Studies course, Mark had students relate all subject matter to real life situations whenever possible. This was done through virtual reality exercises, or through considering similar incidents over history. For example they might be asked to recreate a revolution. According to Mark, " the synthesis is they create their own revolution and have to apply the principles on the top according to the stages - or a document. They can come up with a political document, so to speak." Mark asked the students to pick a country, and they acted the parts of real people in order to recreate significant historic events from that country.

Mark explained why it was so important for his students to connect their work in school with life beyond the classroom. "I think if any discipline is to have relevance to a learner or a student, you have to be able to apply it or at least relate it to something that's concrete - outside of the text book". He added,

. . . you can combine the two - give the students the background knowledge yet allow the students to see with their own eyes. For example if you went to Carmmanah . . .if you talk about deforestation . . . if you talk about the logging practices. . . if you talk about anything. . . . but yet if you drive through and see where they've actually clear cut, all of a sudden the affective kicks in. . .

Joanne attempted to get her students beyond the textbooks in science class in order to help them relate science to real life. She spoke of several experiments, involving

insects gathered by students - experiments that were similarly mentioned and enjoyed by students for the same reason - they were "real". Joanne gave research projects to students and required the students to discuss their ideas and findings with persons in that field of study.

Not all teachers agreed that the curriculum should relate to real life. For Bob, it was more an issue of the systemic problems of curriculum, than the issues of connections with life. To give a sense of Bob's rationale here, I have included a section of one interview with him. When asked how he made the daily curriculum real or applied it to the real world, Bob uncovered a few barriers, and spoke at length about a larger systemic problem in math, which prevented the possibilities of making curriculum real in mathematics class. The discussion illustrates Bob's main concerns for the overloaded mathematics curriculum as he perceives it.

Bob: . . .because the present curriculum. . . and I've talked with other teachers about this . . . And a couple are even threatening to get on the curriculum committee. But the present curriculum in mathematics is about one-third overloaded. That is, if you cut one-third of the actual content out, then you might have room to do something in terms of higher level cognitive processes . . . Like applications or synthesis or . . . ah . . .

Ellen: I've seen that. My daughter just came through an honors math class in the challenge program and they were overloaded.

Bob: . . . it is . . . It is absolutely overloaded. And of course the agreement is essential. That is, what teachers agree to as the actual content must be delivered. Otherwise the students' educational progress in future years is seriously . . .

Ellen: Yes. . .

Bob: . . . undermined. So it's not like a teacher can say, "Well, there's one-third too much content here, so I'm just hacking it out and then I am going to do some application things . . .and so on . . .or whatever enrichment things you want to do. Because the very next year, that student is going to be missing one-third of the content. . .

Ellen: Yes, so Bob if you were appointed tomorrow to the highest curriculum committee to change that . . .how would you change it? What would you do? How would you resolve that conflict?

Bob: Well, . . . schools have to make choices. And by and large . . . the way schools are structured now, there aren't any real educational leaders in the school. That is, the

curriculum and instruction exists in small departments, and there is nobody managing the thing. . . .

Ellen: Oh . . .

Bob: And so when everybody . . . anybody comes along and says, "Well, isn't this a good idea here . . .or isn't that a good idea. . . "it's just added in, as another course.

Ellen: Oh.

Bob: And the same thing about the curriculum itself. You know? In mathematics they just toss it in. And it's easy to toss things in. It's very difficult to toss things out. So . . . plus . . .there's no overall philosophy of education that would indicate what priorities should be. . . .

Ellen: Yes?

Bob: . . . and so without that in place, the present curriculum is just . . . toss everything in there. Load it up in mathematics, load it up in science, and also load it up in other things. You know I mean teach driver training, sex education . . whatever you want, just toss it in there. And I think it's well recognized . . . it's not just me that recent MacLean's review of education for example. . . .

Ellen: Yes.

Bob: Many people who've studied the problem indicate that there is a day hopefully in the relative near future where education will have to get its act together and . . . have priorities. And try to say, what should be in and what should be out.

Ellen: Yes

Bob: And right now, just everything is tossed in. . . .

Ellen: I see . . .

Bob: And what's dominating the curriculum now is the low level stuff. Facts and so on.
. .

Ellen: Very interesting.

Bob: And calculations. . . .And there's literally no room. . .

Ellen: Yes.

Bob: Well, you make room at your own peril.

Ellen: Of course.

Bob: You make room by tossing core out . . . Or you make room by overloading students, by saying to them, "Not only will you do all this do basic core curriculum, which is really one third too much to start with, but we'll also dump some more applications and other things on top of you like that, you know? Of course that overloads them completely. . . .

Ellen: Of course it does. . .

Bob: And makes the whole high school experience totally distasteful.

Ellen: Very interesting.

While Bob perhaps expressed the notion of curriculum overload most concisely, many other teacher and student comments confirmed this problem. In other words, the concerns Bob expressed here, concerning mathematics, were also experienced by others in each of the four subject areas. Unlike the other three teachers, however, Bob did not

offer any alternatives to this dilemma, nor did he indicate that he provided students choices within the prescribed mathematics content. Since he was not asked specifically if he provided such choices, however, it could be that Bob simply did not speak about these.

While most teachers agreed with students that curriculum, in order to be useful and relevant to students' must be related to real life beyond the classroom, they were less agreed on how this could be accomplished. The problems that attend "making content relate to the world outside class" sometimes surfaced in our discussions. One such problem, was identified as the larger systemic problems in the high school mathematics curriculum, for example, where mathematics teachers are not at all agreed on how this connection might take place. Typically, when teachers expressed enjoyment in their teaching, as with students in their learning, they also identified a relationship between the curriculum and the world beyond the classroom. Each of the teachers interviewed argued that the benefits of finding connections are worth any difficulties that may attend such an effort. This fact was not surprising, since the four teachers met regularly over several years in order to build an integrated curriculum.

Educational theorists, Common (1987), Anderson (1982), Jacobs (1989) and Gardner (1992) would support the teachers desire to identify the relationships between the curriculum and life beyond the classroom. In fact, the literature suggests several ways in which curriculum can be "made real", or "related to the real world." For Common the two worlds are drawn together through narrative; for Anderson a sense of reality is cultivated through a supportive school climate; for Jacobs integration of the disciplines contributes to the curriculum's connection with reality; for Gardner the real world comes

into the classroom through performance-based assessment, or the activities which allow for the expression of, and assessment of at least seven ways of knowing.

6.8 Teachers' Perceptions of the Roles of People at School

Concerning the topic of "people", the teachers had far less to say about parental involvement, than their students. Teachers, however, did express an openness for parental input, although according to teachers, parents did not appear to be currently involved in any significant way at the curricular level in high schools. The teachers agreed that more ways to involve parents further in school life should be explored, however. Teachers, however, did not mention any pressures caused by parents. Parental pressures, identified by the students as desires for their sons or daughters to become doctors or lawyers, a fact which hindered their enjoyment and success at school, were in no way identified or discussed by their teachers. Probably, the most significant reason for fewer references to parents in the teachers' comments was my own omission of any specific reference to parents in the interview questions. The above reference to students was included, not to make comparisons between teachers with students, but to show the teachers' perceptions as they are related to the issues identified by students.

Teachers often referred to using people external to the classroom as experts who could enrich a certain topic. For example, Mark, described how people in different cultures, or in different life circumstances could enhance his social studies topics. For Mark, these people included, guest speakers, his administrators, and other experts around the world. He even suggested using modems to communicate with outsiders, when distance prevented a more personal contact.

- Ellen: Umhum . . . Now people. What people would you say contribute most to your social studies class?
- Mark: My students. Um . . . I would like . . . again. . . an ideal situation is the oral participation from my students as the people. Guest speakers.. . I don't know if that's what your thinking?
- Ellen: Yes, yes it is. Because I am looking at people . . . all people. . .
- Mark: An example again, (laughs) is . . . ah . . . next week we have a survivor of the Holocaust to speak to my grade 11's . . . is something they were interested in.
- Ellen: Did they choose that person? Or did you, or did they know the person's background ahead of time? Or how did that come to be?
- Mark: I said it is possible to do this. And they said how? And I said OK - here is a phone number and they phoned some one. . . and they arranged it, and . . . ah . . .
- Ellen: Very good. They arranged it . . .
- Mark: . . . and ah . . we have this person coming in on February the 8th? February the 8th . . So I think we're on the concentration camps. . . . So it will be very moving
- Ellen: Very moving.
- Ellen: Who else would you ask to participate in the program in order to develop your students' highest individual abilities? Can you think of other people that . . .might be included in your social studies program . . . or . . so that students' individual connectedness or differences would be addressed?
- Mark: I think other institutions . . . or people in other institutions outside of the school would be my authorities. . .
- Ellen: School institutions. . . or . . .?
- Mark: Yeah. Universities. . . research . . . ah . . . libraries. . . um . . .
- Ellen: Um . . . I think you're the one to do that kind of connecting too. ...
- Ellen: . . . because it just hasn't been done.
- Mark: Yeah. yeah. . . no it hasn't been done. Well, again with technology and the modem. I am trying to encourage students to use the modem. And we are going to have electronic mentors, through EDNET now. A mentor would be someone in the area of environment. Ah . . . and they can link up with this person, and they might have 5 or 6 questions that they would like answered. And they fire it onto the modem through EDNET. And the electronic mentor would pick up the question and then answer it and then other people in other schools will see the answer and they might want to respond to that.
- Ellen: Excellent. Do you see that in place this year?
- Mark: Well, Moira Hill (Director of Gifted Students' Programs), mentioned it when I was at the future problem solving workshop with some students in the city, . . . and said in the near future it will be on.

As the discussion illustrates, Mark (and the teachers in general) tended to focus on outsiders who could enhance his curriculum material, rather than concentrate as the students did, on the significant contributions of friends and parents. This segment shows

that Mark viewed people, external to the classroom, as an important part of his everyday classroom activities.

Teachers focused their discussions mainly on their own roles, the students' and experts' roles as resources in various fields of study, while students referred more to parents and friends. They tended more to consider themselves and their students as the most significant contributors to the students' acquisition of knowledge.

Indirectly, however, the teachers showed concern for both parental involvement and friendships among students. These concerns were evidenced in the letters which these teachers published from parents in the schools' newsletters, from their initiation and support of the student-led conferences, and from the many activities where students were encouraged to relate to one another in class. Examples of these activities included the pair-share groups described by Joanne, in order to make hypotheses in science class, and intensive small group preparations before a trip to Japan, as described by Mark.

6.9 How Teachers Perceived the MITA Model Development and Implementation of MI Theory

Since the MITA Model originated partly from teachers' perceptions of MI theory in the context of a curriculum development initiative, the following three sections will explore the teachers' perceptions of this endeavor. It is not surprising that the teachers agreed with many of the components of the model, since its development was generated by their ideas about students' individual differences and the importance of developing curriculum experiences to meet these differences.

There were, however, several concerns about the MITA Model's proposed process, expressed by teachers, both in the individual interviews and in group sessions. For

example, the MITA Model components included *increased parental involvement*. The teachers agreed with the notion of involving parents more in curriculum related matters, but two expressed uncertainty as to how this could be done. Teachers recognized the insignificant role provided for parents in conventional high school curriculum, and provided suggestions for parental input. Bob mentioned, that while he welcomed parents' ideas, he "suspects that by and large parents don't have very much input to offer as far as the subject matter goes". John mentioned that parents may be involved as guest speakers in the classroom. The student-led conference was one attempt made by the school, in order to involve parents more actively in curriculum planning, and at the same time to address the students' individual development.

In order to document their ideas about matters such as parental involvement, teachers were provided with draft copies of each phase of the development of the MITA Model, during the study. That is, notes of our collaborative work, and suggestions for using these ideas in the MITA Model development (see Appendix F) were presented to teachers on a weekly basis. These draft presentations usually followed our collaborative curriculum planning meetings. Similar to the minutes of a meeting, the draft copies acted as a reflection on our discussions and as a guide toward future meetings. As the MITA Model diagram (see Figure 4.1.) evolved, draft copies of diagrams were also regularly presented to teachers for their input. In addition two videos were provided for teachers to view samples of schools that had applied similar models at the high school level. The first Video, "A Look at the Schools of the 21st Century Grant: Shorecrest High School", is a presentation published by senior students of Shorecrest High. The film documents both the integration of projects, similar to the curricular integration being undertaken in the present study, the students' reactions to integrated studies, based upon MI Theory

approach. The second video brought to the school, "Common Miracles: The New American Revolution in Learning", produced by Jennings (1992), describes the educational reform movement in the United States over the past 10 years, using an integrated learning approach. The purpose of these films was to illustrate MI Theory in operation in the high school classroom, for participating teachers.

While Canadian examples of similar models, were sometimes discussed at our collaborative meetings, we had fewer materials to demonstrate integration in action in Canadian high schools. The current reforms in American schools, it was hoped, would provided a starting point for our discussions on integration and what implications MI Theory has for the process. Unfortunately, while the films were viewed, discussion of the material took place with only two teachers, partly due to a teacher strike which interrupted the work, and partly due to busy timetables of the other two teachers involved. Since I had provided previously, many hard copies of the documented change processes at Shorecrest, these changes were discussed at several meetings, and the teachers expressed an interest in visiting the Shorecrest School at some later date.

During informal discussions with each teacher, they were asked: "How can MI Theory help students to develop their individual abilities?" During these discussions, the teachers typically agreed that the curriculum should accommodate these differences and they offered three main suggestions for how student interests and abilities might be developed. Firstly, the teachers spoke of "getting beyond" the prescribed curriculum. Joanne, for example, referred to projects that "get past the curriculum" and spoke of ways that she helped students to "value their own opinions". When students valued their own opinions Joanne suggested, they "use their own ability to look at things". Teachers were generally in agreement with students here. Kara, for example described the

students' wish to get beyond the text when she described how the class collected beetles for observation in Joanne's class, and Joe told how he enjoyed conducting experiments that were not in the textbook.

Secondly, there was an attempt made by teachers to provide as many choices as possible for students. John, told of negotiating with his class the dates for project completions, and of encouraging a wide range of student responses to each question. Mark, John and Joanne spoke of their regular attempts to make students think individually. All four teachers described students who showed different abilities and illustrated activities that would accommodate these. While teachers agreed that exploring and developing individual differences was an important part of learning, less emphasis was placed on helping students to discover their own interests and abilities.

Thirdly, teachers spoke of cultivating an environment where students could make more individual choices. Such an environment differed significantly from one teacher to another. In mathematics, for example, Bob told of placing students of similar interests and abilities together, in order to provide more choices for students. Teachers expressed the hope that by providing more choices for students, and by guiding them to select a variety of interdisciplinary projects, students would find more learning activities that challenged their abilities. The teachers identified three significant barriers within the current high school system, however, to using MI Theory to accommodate students' individual differences. These barriers are outlined in the following section.

6.10 Teachers' Perceived Barriers to MI THEORY Application

Typically, the teachers agreed with students on the following three perceived barriers to MI Theory, as this theory applies to present educational practice. According

to the teachers, these three barriers include: first, the limited time, in a high school day, combined with the many pressures and demands for that time. Time constraints, Bob argued, do not allow time for the development of individual interests and abilities as advocated by MI Theory. Second, the conventional mandated curriculum already makes too many demands, and MI Theory application could become another demand on teachers and students. And, third, the universities make "rigid" requirements that students must meet, and these requirements typically do not include the development of students' individual abilities.

According to the teachers, the mandated curriculum appeared to interfere at times with the use of MI Theory to address student individual differences. That is, teachers felt restricted by the need to "cover curriculum" in order to prepare students for the provincial exams and university requirements. One teacher described this limitation as being "bound to the curriculum."

As discussed previously in this chapter, all four teachers expressed concern for providing a curriculum that is relevant to their students. Their discussions about appropriate curriculum often centered around individual student concerns. There was a special concern frequently expressed, for example, toward expanding student choices in course selections, leading toward providing courses and activities that relate more specifically to each student's own immediate and future goals. This concept of providing more relevant and appropriate courses that accommodate individual student differences, is supported by Sullivan (1988, p. 33).

6.11 A Final Note

This chapter has discussed the teachers' responses to those issues that were identified by the students in Chapter 5. Where did the teachers guide me in terms of the development of the MITA Model used in the study? That is, what conclusions can be drawn regarding teacher perceptions of this curricular initiative from teacher interactive interviews, collaborative planning sessions, and group discussions? The teachers' responses to the research questions, and to the five curricular initiative foci or sub-sections identified in this study: time, space, authority, subject matter, and, people, were used to develop and extend each phase of the MITA Model, as illustrated in Chapter 4. While the study's emphasis was mainly on students' perspectives, the work was greatly enhanced by the teachers' perspectives on each of the topics that students identified. In addition, the teachers' collaborative work was especially helpful in the development and application of the MITA Model.

The curricular initiatives were often complex, and at times teacher frustrations became evident, during the meetings. For example, the teachers frequently expressed their frustrations over personal time constraints. Two teachers also expressed a desire for additional room and in some cases, additional resources were requested, such as tables for students' group activities, and computers for the classroom. The main causes for frustrations, however, were the hectic schedules kept by all four teachers. On several occasions teachers were called out from the meetings and at other times one or two teachers were away coaching an athletic team.

Sometimes our meetings were heated. The teachers often disagreed (at times vehemently) on several of the topics we discussed. The four teachers varied widely, for example, in their notions of how students' differences should be developed. Through

discussion and interview segments throughout this chapter, some of the most fundamental teacher differences were illustrated. Nor did the teachers agree with students on some topics. Regarding students' authority, for example, the teachers differed dramatically from the students. In fact, while teachers identified the tension as one between students having authority for their learning, or teachers holding that authority, students perceived authority in quite a different place. In contrast to their teachers, the students suggested that authority for learning also rested with their peers and their parents, rather than exclusively with themselves or with their teachers.

The teachers differed from their students in three significant ways. First, the teachers typically expressed more concern over issues of external curriculum resources and the external environment. The students, on the other hand typically valued more their peer support groups. Second, teachers did not refer directly to friendships as a significant part of curriculum development. Students, however, regarded friendships highly, and spoke at length about the issue of peer relationships and learning. Third, teachers did not comment at any length on parental involvement, while students, on the other hand, referred to parents as key players in their high school development. Teachers generally agreed with the students in two main areas. Both emphasized the importance of student authority, as well as the significance of making connections between the real world and curriculum.

In Chapter 7, the concluding chapter, I present a summary of the perspectives of both teachers and students, as well as indicate further research recommended, as a result of this study.

CHAPTER 7: CONCLUSIONS

7.1 Introduction and Overview

The purpose of this chapter is to summarize the conclusions to the research questions. A brief description of the data that were collected to address the questions, is provided. Areas for further study are outlined and discussed, particularly research directed toward determining the nature of peer relationships and parents' involvement in developing students' individual differences in school; strategies that could be used in order to involve parents and peers in high schools in a more significant way; and, the usefulness of the MITA Model.

In subsequent sections, readers are alerted to some of the methodological and practical limitations of the study and a brief discussion of the generalizability of the study is presented. Several larger educational issues of which this study is a part, are explored, such as the change process occurring at the provincial level which was also influencing change at the high school research site. Finally, the relationships between the research results and the literature reviewed in Chapter 2 are highlighted.

7.2 The Questions Guiding This Work

The main research question guiding this work is:

1. What is the nature of the curriculum development process when high school students and teachers in their classroom practices, apply ideas congruent with Multiple Intelligence Theory, in order to address individual student differences, within the traditional constraints of a high school? How can these processes be incorporated into a model?

In order to address this question, the MITA Model (illustrated in Chapter 4) was developed as one response which requires a collaborative effort between students and teachers. This model, which represents the main outcome of the study, was presented to the four teachers at several intervals during its development, as well as discussed informally with each student, it was ultimately influenced by my understanding of MI Theory, my philosophical assumptions, and my educational experiences, which were not necessarily shared by the eight students and four teachers. This model provided a heuristic for the introduction and application of MI Theory at one high school.

In order to investigate some of the issues concerning the provision for individual differences of students and the respective roles that they played in the development of the MITA Model, two further research questions were framed. These questions and a brief response to them are outlined below:

2. What was the role of the students in the development of the Multiple Intelligence Theory Application Model?

As outlined in Chapter 5, the students responded to interview questions I asked them, concerning: the use of time in high school; the role of physical space at school; the existence of student authority in class; the place of subject matter in learning and, the involvement of other people in their class activities. These five sub-sections were also used to organize the questions and discussions concerning their existing curriculum, and MI Theory as a useful method of developing their interests and abilities.

The students had very little to say about the topics of time and authority, but made several significant recommendations about the topics of space, subject matter, and

people. Concerning time, students typically expressed regret that because teachers "had to cover" too much curriculum in the textbooks, there was little time to consider their own interests or abilities. When I asked students about authority over their own learning, they usually described their teachers as flexible and concerned that they be given choices. Students typically suggested that they were given some authority to develop their own abilities.

The students had more to say about space, subject matter and the involvement of other people in their high school activities. Classroom space, they recommended could be better organized in order to support increased opportunities for peer interactions at school. Friendships and peer support figured centrally in the students' interviews and informal discussions. In fact, the students tended to shift the emphasis away from the physical classroom space that I attempted to address, and talked more about the psychological space of peer relationships.

Concerning subject matter, students most enjoyed topics which related to life beyond the classroom which allowed them to use their interests and abilities. A particular enjoyment was expressed for curriculum that provided hands-on activities, such as a "wood lice" experiment described by Elaine, Kara and Keith. They sometimes referred to their texts as dry, not related to real life, and boring. In general, the students enjoyed school most when their curriculum was related to the world, and especially when they could see the connections, such as the lesson Sam described, a business education unit where a credit union manager came in to teach the class. The students also expressed a frustration that rigid university requirements often preclude opportunities for individual development.

Concerning people, the students expressed a desire for more parental involvement in classroom activities. They recommended, for example, more student-led conferences where the parents would come to school to interact with students about their thematic projects. Kara extended this notion to also recommend increased involvement with grandparents and the elderly community.

Students also expressed particular appreciation for the caring community of teens at their school. They spoke of student friendships as useful to increase learning, provide friendly competition, and keep them "on guard academically."

Furthermore, it should be noted that in order to examine the students' perceptions of the particular application of MI Theory used in this study, the students contributed to the construction of the MITA Model as discussed in Section 5.2.7., but they did not respond directly to the final development of the model. Discussions were held with the students on three occasions during the development of the model. The lack of direct student response to the application process, however, was due to two main causes. First, because of the strike, there was inadequate time after completion of the integrated curricular unit to interview the students about their overall reactions; and, second, The MITA Model was not implemented in any standard manner by all four teachers, as earlier discussed. In fact, according to two teachers, the MITA model would likely be used more extensively in the future, and so would probably yield further students' responses at that time.

Students did, however, respond indirectly to the MITA Model and the study's particular application of an MI View of Learning. Throughout the model's ten-phase process, the students made recommendations, and suggested procedures that they enjoyed. For example, the students generally expressed appreciation that the teachers

collaborated at times, with one another. Keith said concerning student workloads and projects that used a thematic approach, "The teachers do not give us major projects at the same time because we have too much homework". The students, however, appeared sometimes to be unaware of the teachers' collaborative efforts.

Figure 5.1 shows the students' descriptions of their final projects as these related to their previously identified intelligences (as illustrated in Figure 1.1). It is interesting to note that Figure 5.1 illustrated a more significant relationship between student passions and their final interdisciplinary projects. It should also be noted here that the principles of MI Theory were introduced to both teachers and students after the findings illustrated in Figure 1.1 and before the more significant relationship indicated in Figure 5.1. Two reasons for the greater evidence of MI Theory principles which occurred later in the study, are: i) teachers were more aware of MI Theory as it applied to high school curriculum and ii) students were given a language to describe their individual development.

The following discussion concerns the teachers' perceptions of the issues related to the MITA Model and their role in implementing it, as articulated in question 3.

3. What was the role of the teachers in the development of the Multiple Intelligence Theory Application Model?

The teachers expressed similar frustrations, to those offered by the students. For example, they suggested there was too much curriculum to cover and too little time to do so. The teachers sometimes recommended larger classrooms with more comfortable furniture. Teachers suggested that desks should not be fastened down but should be designed for greater flexibility of movement. The teachers generally supported

collaborative groups, but at times expressed the problem of "too much curriculum" which interfered with the amount of time or emphasis they could give to peer support.

The teachers appeared in one sense to be caught between the desire to increase student empowerment and the desire to fulfill their professional responsibilities. Again they mentioned their frustrations over meeting the demands to "cover" all the curriculum content. Two teachers expressed the desire for more shared responsibility with their students, and suggested several strategies (outlined in section 6.6.) for doing so.

The teachers like the students expressed the need to make the curriculum apply to the "real world" beyond the classroom. But again, they suggested that the overload of curriculum content prevented them from making relevant connections between the content and "real life".

Teachers rarely mentioned existing parental involvement. They did, however, express a desire to explore more ways to foster parental input. Teachers tended to focus more on out-of-school experts to enhance the curriculum material.

The teachers' responses also provided useful contributions during each phase of the MITA Model development. As the development of the model progressed, teachers expressed both agreement and some concerns with the direction it was taking. They generally agreed with the idea of developing student abilities, interests and individual differences. They expressed concern about: the limited time to apply the MITA model, because of the many existing demands on time and energy; too many demands to cover conventional curriculum already existent; rigid entrance requirements of the university.

The problematic issues raised by students and teachers in this study, mainly concern the relationships among the explicit curriculum, the hidden curriculum, school structures, and teaching intentions. In a similar manner to Britzman's (1991) suggestion

that student teachers should explore how their experience in school shaped learning expectations, their own sense of power, and their relationships with teachers and other students, this study supports ideas about exploring students abilities and interests within a high school community of teachers and their students. The MITA model, as outlined in the study, was designed to facilitate the development of students individuality in high school, and to provide one method of exploring students' experiences.

In summary, William Yeats said: "Education is not the filling of a pail but the lighting of a fire". Les, one student participant, illustrates it this way,

Teachers light the fires for students and then provide ammunition for students to learn - the students then must keep the fire going in order to succeed.

In this study, the lighter with which the teachers ignite the flames is an MI theory view of human capabilities, while the fuel (or ammunition as he calls it) which students require to "keep the fires going" is a curriculum which fosters the development of several of students' preferred ways of understanding the world around them.

7.3 Limitations of the Study

The limitations of this study are organized around methodological and practical issues. These are discussed in turn below. The methodological issues, which are discussed in section 3.6, and outlined here, influence the study's claim for generalizability. The single site, a public high school for gifted students in grades 8 through 12, which already provided integration of subject specific courses, was atypical in many ways. These are discussed in detail in section 3.2.

The somewhat unique context of curriculum change in the province of British Columbia also limited the study. The teachers at times felt caught between the *Year 2000 Documents'*, (1990) recommendations for changes which were consistent with the MITA Model methods, and they sometimes expressed resistance to such changes especially because of anticipated pressures from the university's rigid requirements.

The practical limitations also discussed in Section 3.6 influence the validity of the study. This limitation concerns the possible restricted use of the MITA Model within high school classrooms in general. Is the MITA Model's usefulness, for example, restricted to a particular kind of setting or specific circumstances? Because of the teachers' strike near the conclusion of the study, and my inability to collect data following the completion of projects, which were based on the MITA Model's use, I was unable to conduct further discussions that were scheduled with both students and teachers, to determine the usefulness of the MITA Model.

7.4 Issues of Generalizability

With regards to analytic generalizability the MITA Model provides a potential organizing framework for subsequent researchers and curriculum developers interested in exploring the development of individual differences at the high school. The strongest argument for generalizing in the study is case-to-case transfer. Case-to-case generalizability refers to the situation where other investigators are able to gain valuable insights regarding significant aspects/relationships/findings from a study and to adapt these insights for use in their own settings. In this study I argue for case-to-case generalizability since I provided a "thick description" of the setting and study to allow for such transfer.

As this study is atypical in many ways, the study does not permit two types of generalization for qualitative data as discussed by Firestone (1993). He pointed out that, in qualitative research it is difficult to generalize findings to settings not studied. The strongest argument for generalizability, broadly accepted by quantitative researchers, he claims, is "extrapolation from a sample to a population". Here, in order to generalize, the researcher identifies a population of interest and then draws a random sample of that population to study. Firestone pointed out that inferences from sample to population are strengthened by knowledge about the probability that certain kinds of cases will fall into the sample.

This study does not fit the "sample to population extrapolation". The sample was not selected randomly, so that each member of the population would have an equal opportunity of being selected into "the sample". Furthermore, only one site was studied. For those reasons no inferences can be made about how closely the characteristics of the setting in the present study reflects the larger population. Nor does the study fit Firestone's category for analytic generalization or "extrapolation using a theory." In order to generalize to theory the study would have to use MI Theory to make predictions, and then confirm those predictions based on the outcomes of the study. In this study, MI Theory was applied in one particular setting, and so replications under conditions that exactly repeat the original study would therefore be required in order to reliably generalize to theory.

The MITA Model also contributes to the literature on two learning approaches, particularly as the findings of this study generalize to constructivist and MI Theory learning approaches. Specifically, as Doyle (1983) argues, constructivist learning is based on a system of personal constructs, associational networks or schemata, which

is constructed and modified on the basis of experience and prior knowledge. At the heart of constructivism is the constant dialectical interplay between the learner and the curriculum. The MITA Model extends Doyle's notion of interplay to include communications among the learners, teachers and parents, and accommodates a collaborative community of learners. So the MITA Model is based on constructivist principles which extend to include an active and collaborative learning community at the high school level.

An MI view of learning at the high school level is primarily based on the philosophy that high school students' abilities and interests would be more readily accommodated through the development of at least seven intelligences. This MI Theory view of learning which is also commensurate with the constructivist view has been used predominantly in elementary school practice. The MITA Model developed in this study provides a model for using MI Theory principles in the high school classroom. The model could be used as one way to, what Jacobs (1991) terms "transcend rigid discipline boundaries," and provide high school students with a number of modalities and a wide design of instructional experiences such as interactions with teachers, parents and experts in the community, in order to encourage both individual and cooperative learning.

7.5 Questions For Further Research

Through their recommendations during interactive interviews, and their responses to the study's focus questions, the participating students challenged me to consider a number of significant additional questions. The questions listed below, while addressed to a limited extent in the present study, must be examined in much more depth and serve as focal research questions for further studies.

1. How can we allocate school time in order to include the students' passions for knowledge?
2. How can we cultivate an environment where friends are free to nurture and support one another.
3. How can we increase student authority in order to promote independent learning?
4. How can schools be more connected to the students passions and the real world of today?
5. How can we encourage parental involvement in more critical curriculum issues?

According to the students in this study, their friends and their parents are already backstage players who contribute in important ways to their high school education. In order to actively include students and parents in curriculum and planning sessions, however, further research would be necessary in two areas. First, research should be undertaken to determine the nature of existing peer and parental involvement in typical school situations. Second, research is necessary in order to investigate strategies for increasing parental and peer involvement in a more central way in the planning and presentation of the high school curriculum.

Further studies would be useful to determine the extent to which students and teachers value the notion of promoting individual differences in the high school curriculum. This study briefly outlined some of these issues for a somewhat select group of students and teachers. For example, students and teachers agreed on the strengths and weaknesses of the existing curriculum to meet individual interests and abilities of

students. The two differed, however, in their perceptions of the degree and type of responsibility of students for their own learning, the amount of parental influence, and the importance of peer relationships to students' individual development. Further studies would be useful, in order to examine the issues associated with fostering students' individual differences in more detail.

As previously suggested, more research is also required, to determine the usefulness of the MITA Model in the classroom. Particularly, its usefulness as a generative model for addressing student individual differences. For example, would the MITA Model be useful to help high school students develop more ways of knowing than conventional school programs currently appear to do? Such a curriculum project, using the MITA Model process, would involve extensive discussions and in-depth communication with students, parents, and other related partners in learning. Another aim of this project could be to examine the ways in which teachers' practical knowledge might be utilized in this process of collaborative curriculum development. According to Elbaz (1991), teacher knowledge, which is essential to curriculum-in-use, would be awakened through the collaborative process of curriculum development. More important, such a collaborative project would provide a forum for students to be more active participants in shaping the learning environments that they inhabit.

7.6 Larger Educational Issues

In Chapter 2 the Year 2000 Documents (1991), were described as the macro-level change process occurring at the Provincial level but which was also influencing the high school research site. The overriding principles of these documents were also consistent with a constructivist and an MI view of learning. Access to the school was

in part facilitated by a commitment on the part of the teachers to change already in progress, change also consistent with the MITA Model. Since the Year 2000 recommendations were outlined in Chapter 2, this section will comment only on the document's particular recommendations that relate to concerns that the students raised.

According to statistics cited by Robitaille (1988) high schools fail to provide enough adequate programs to interest and motivate students (pp. 52-55). Reports from the B.C. Royal Commission on Education show that for every 100 British Columbian students who begin grade 9, between 30 to 40 fail to complete Grade 12 graduation requirements. In fact 2 out of every 5 students either fail or drop out (Robitaille, 1988, p. 53; Marx, 1988, p. 28; Sullivan, p. 14 - 15). One conjecture to partially account for this dropout rate is the lack of relevant school programs. Hence, one of the expressed goals of the Year 2000 Document is to offer a curriculum that is both relevant and appropriate for all students. Many students, according to the Commissioner's summary, might remain in school, if they could participate in courses other than the traditional academic ones.

There is also concern expressed in the *Year 2000 Documents* that students who do not plan to enter higher learning institutes require more relevant programs in high school. Statistics show that approximately 70% of students who finish grade 12 do not go into higher education following graduation (Marx, 1988, xi). Furthermore, of the 30% who enter university, only a reported 19% obtain a degree (Marx, 1988, xi). Increasingly, however, the core curriculum in high school graduation courses is reflective of the curriculum courses required for university entrance. How does a curriculum that is required for present university entrance requirements accommodate 70% of students who will not go on to university courses?

Students interviewed for this study, however, for the most part expressed their intention of attending higher learning institutes. The teachers, however, expressed concern for providing a curriculum that is relevant to all students. Therefore discussions concerning appropriate curriculum often centered around such concerns. There was a special concern frequently expressed toward expanding student choice in course selections, leading toward providing courses and activities that relate more specifically to each student's own immediate and future goals.

The *Year 2000* Documents because of their similarity to the curriculum proposals at the research site, helped also to identify some of the difficulties we faced. The Documents, for example, proposed that in addition to 12 units of General Studies' compulsory courses in Grade 11 and 12, the students ought to have a choice of 5 "Selected Options". These included: Exploration Option; Passport to Apprenticeship Option; Career Preparation Option; Community-School Partnership Option; and, University Option. Every student in the program was expected to select from 5 options, but some students were expected to complete more units of work than others, based on their choice of options. At first glance, the program appears to accommodate students individuality and special abilities. But, as evidenced in this study, problems inevitably arise from such a complex system. These problems included: who decides who takes what, and how do we know that a student is obtaining the skills required in later life? Another concern the many options raised was: How can we accurately assess the students according to normed assessments? If students are not assessed according to the norms used for other similar age groups, will they be adequately prepared for higher learning or for their careers? A far more immediate concern frequently arose in our

weekly discussions, "How is it possible to keep track of so many students doing different courses and activities at different times?"

The *Year 2000* Documents highlighted several of the student concerns and also provided a framework from which the MITA Model was developed. In its role as a policy statement for the study, the *Year 2000* document, since it addressed students' concerns, also provided a framework for our study from which we considered some of the difficulties that would attend our efforts to implement the MITA Model. Associated with any curriculum that aims to accommodate student differences, for example, are the difficulties associated with locating related assessment tools, and restructuring a program to suit the many participants involved.

In one sense we found in the document, a measure of support in our efforts to find successful, relevant, and individual programs for high school students. Clearly it is unrealistic to expect students' expressed interests and abilities, alone, should dictate these (*Year 2000*) alternative choices. Nevertheless, students should be consulted in the curriculum choices they make, as is suggested in the *Year 2000* proposal. I would argue further, here, that students and parents should be enabled to participate in the construction of the high school curriculum, as discussed in the MITA Model approach.

The literature review in Chapter Two illustrated that many previous research studies have utilized or focused upon only one of three perspectives informing this study: integrated curriculum construction; constructivism; and, MI Theory. This study explored the relationships between high school curriculum and students' perceptions of their individual differences, and identified the gaps that exist. The study differed from previous research in that it examined the application of MI Theory within an integrated curriculum approach in the high school setting.

Based on Doyle's (1983) definition of constructivist learning, (a system of personal constructs, associational networks or schemata, which is constructed and modified on the basis of experience and prior knowledge), this study identified some of the barriers to constructivist practice within conventional high school curriculum. For example, too much curriculum content and too little time, often prevent the active engagement with other learners, conditions that Vygotsky (1978) and Piaget (1970) argued are necessary for individual development.

The study supports Duckworth's (1983) argument, however, that constructivism is often little more than a new catch word in high schools. In other words, people using the term, Duckworth argues, frequently hold different notions about what constructivism means and how to implement its principles. One major barrier to individual development, identified by Duckworth however, was not found to be a barrier in this study. Duckworth argued that teachers are too often unwilling to change their behaviour, based on new paradigms about learning. In this study the teachers constantly changed their practice and actively sought more effective methods of teaching, based on what they knew about learning.

Gardner's (1983) MI Theory which states that all humans are capable of developing to some degree at least seven semi-autonomous ways of knowing the world, is supported by the study's findings. Each of the seven intelligences was identified by students and teachers in both verbal and written responses. Gardner argued that students do not automatically transfer knowledge from one situation to the next, and must be provided opportunities to apply knowledge in a variety of activities. In other words, when teachers provide opportunities for students to develop strategies for solving problems and creating products, students are more likely to transfer knowledge from one

setting to another. It was found in this study that the current demands on time, by mandated curriculum prevented important opportunities for students to develop their many different intelligences. Gardner's (1991) definition of intelligence, incorporates three critical educational components: individual development; personal growth; and different learning styles. This study raised the question, "how can teachers accommodate such diversity? The MITA Model was presented in the study, as one way to facilitate the development of more student abilities.

The study posited that a curriculum that incorporates a common thematic unit , and combines MI Theory and a constructivist view of learning is based on three principles. These three involve: students' prior knowledge; seven ways of knowing; and, a recognition that relationships between the disciplines can be dealt with in a high school setting. Furthermore, for these principles to become operative the participants and I realized that the role of the mandated curriculum must shift from its traditional role as an end product, to the more flexible role of providing springboards into deeper understandings. In other words, individual approaches to learning had to become more central to the curriculum design. An illustration of how curricular and instructional designs can be bridged was demonstrated in this study. Our team found that by constructing curriculum around one common theme, "Light" for the grade eight unit, students' knowledge acquisition could be expanded through activities that used an MI Theory view of learning.

The three obstacles to achieving recognition of and teaching for individual differences in high school, generally held in the literature, were supported by the study. First, the myth that education must return to the basic mastery of the Three R's (Bibby & Posterski, 1992; Brown, 1983), was found to be evident, that is, an emphasis on facts

and content coverage. Second, the organization of high schools around particular and segregated disciplines, which is described by George and Stevenson, (1992) as a paralyzing factor to the point that a language for alternatives is barely visible" (p.87) was evident, particularly as students and teachers considered the rigid university requirements. And yet, this site had also successfully integrated some subjects as earlier discussed. Third, the emphasis for testing for students' weaknesses, rather than promoting strengths (Brown, 1991; Gardner, 1987) was also evident in the rigid demands by the university, expressed by the students, that prevented more time and energy for individual development. This study supported Dickinson's (1991) claim that high school students should be provided with opportunities for both the creative exploration of their interests and abilities, as well as opportunities for learning valued skills and concepts through multimodal means. Finally, this study would suggest that if teaching practice is to reflect what we now know about learning, an alternative approach would be useful, to temper our concerns with the three R's, with our "concern for how well today's young people are combining these old skills with the new means available to them . . . " (Bibby & Posterski, 1992, p. 71).

7.7 A Final Note

One significant objective of this study was to describe the students as they are in grade 10 - to show their perceptions of their current curriculum and their ideas about developing their unique abilities. But another equally significant aim was to construct an alternative approach to learning, one that would allow these students to develop their individual differences within the restrictions of a high school curriculum. These two tasks, while related often produced blurry lines, which hindered my ability to focus

clearly, as the research progressed. Within both tasks, the temptation to nail down each detail was powerful. In one sense, I felt that the study put me in charge of constructing a new model by carefully selecting major details in order to find meaning in the students' stories, and to use their ideas as a foundation for the constructed MITA Model. So that with each new chapter I intended to write the students story in tight, clean clear prose. But once I began the process, the stories expanded, became more complex than I had anticipated. In addition to the students' perspectives, all the new voices and angles sprung up around my original story, like a jungle.

How could I remain flexible, and yet establish the necessary boundaries to guide the study? While the process used was systematic and orderly, I attempted to avoid the rigid boundaries that Tesch (1987) refers to as restrictive in qualitative studies. Such boundaries, for example would be a rigid framework where only one theory was accepted, or a limited method of interviewing, such as brief paper and pencil responses. While the process in this study began with a research question, this question evolved over time. According to Tesch, the process is not a science, but rather "intellectual craftsmanship", whereby the main intellectual tool is comparison. Some comparisons can be made throughout the study, comparisons between teachers and students' perceptions, between one student and another, and one teacher and another, between the related curriculum and each student's perceptions of individual development. Students and teachers felt equally concerned about cultivating an environment where learning could take place. For students, this meant creating an environment where friends are free to support one another.

As I wrote the chapters, I questioned whether some of my investigations had not merely yielded results already obvious to experienced teachers. In this study, I have

gravitated toward what Gage (1991) called, "a humanistic insight and sensibility" because of my own experience with humanistic orientations. But I speculate that one would experience no conflict here if a more empirical, quantitative approach had been used. In any case, my findings provided evidence for the position that not only is there a lack of research in the area of individual development at the high school level, but that the MITA Model developed in this study provides one contribution to addressing that gap in the research literature.

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APPENDICES

Appendix A

List of the Teachers' Questions which guided the study

Teachers' questions classified into 3 main categories: 1). General questions that might act as a lens for our discussions; 2). Questions that invite clarification of MI Theory; 3). Questions that may guide our step - by - step curriculum construction.

I.

General questions that might act as a lens for our discussions and a filter for our progress:

- 1). When do the students become involved in the over-all process?
- 2). Could you identify assignments of "learner activities?"
- 3). Specifically how can MI help with process and content on this project (Integrated study).
- 4). We need to agree on topics (themes)
- 5). Do you agree with Gardner's posit that all kinds of intelligence should be emphasized or addressed in all courses?
- 6). Do you agree that alternative approaches including integrated curriculum and learning can happen in individual separate subject, by subject classrooms?
- 7). What evidence is there that kids learn more, better, faster, more easily, or with more enjoyment using either MI Theory or integrated curricula?
- 8). What is the difference between integrated and constructivist views of learning?
- 9). How specifically can you help us facilitate more integrated learning or more learning of any kind both as individual practising teacher and as a collaborative team? (Despite our very best efforts for the last two to six years, most of our time as practising teachers is spent functioning as individuals. Most of the time spent meeting and collaborating has not been productive if the time spent is correlated to student learning.
- 10). We need to agree on a timeline for:
 - a). theoretical introduction
 - b). correlation of topic presentation to class
 - c). student product description
 - d). work time for students
 - e). due dates
 - f). grading procedure and routines

II.

Questions that invite clarification of MI Theory:

- 1). Could you identify evidence for evaluation - process/methods?
- 2). Could you identify within the MI where active learning would take place - exploration / reflective?

- 3). How do the frames of mind connect/ overlap with the 9 perceptive modes which have already been introduced to the students?
- 4). How strong is evidence of slotting specific subjects into the Frames of Mind knowledge?
- 5). I want to see a concrete example of implementation of these (relationship to its) ideas in a secondary school - How do students demonstrate each of the 7 intelligences - when are connections made between them - if ever?
- 6). The MI Theory seems to be an argument for modular or non-integrated study as in the traditional schools. How is it an argument for integrated curriculum and learning?
- 7). Is it your goal that we restructure delivery of curriculum for an entire school year?

III.

Questions that may guide our step - by - step curriculum construction:

- 1). How does MI fit into each of the specific subject areas?
- 2). Identify specific (define skills here?) that might be introduced.
- 3). How does one assess if the student is learning?
- 4). How are Year 2000 recommendations going to alter the ministry prescribed curriculum. How do you see this affecting what is done at Templeton Mini?
- 5). Can you develop some strategies for its instruction, using our themes in this setting? How does this fit with student led conferences?
- 6). We need to agree on course correlations if we are going to use existing core curriculum. How is curriculum to be delivered? Is there any supplementary curriculum needed?
- 7). How do we assure progress as opposed to another new fad?
- 8). We need to agree on specific student products - that are acceptable.
- 9). We need to agree on how much of the model is to be communicated to students - and when?
- 10). We need to agree on a model for interdisciplinary study?
- 11). How do we focus on the development of an integrated student unit - as opposed to global restructuring?

APPENDIX B

TEACHER and STUDENT INTERVIEW QUESTIONS

These interview questions are merely a guide into an informal conversation between the participant and researcher. My intent, as demonstrated by the questions is to identify students' and teachers' perceptions of individual differences, and to explore how these different abilities are addressed in current high school curricular structures. since it is held that curricular organization directly impacts on classroom instruction. My major concern is to identify and describe both student differences, and curricular structures through the:

Research question: *How do the curriculum structures (i.e. the time, space, authority, subject matter and people) in one urban alternative school, address individual student differences?*

These interview questions represent an attempt to "get at" each of the five basic components of curriculum structure, since a school's curricular organization is dependent upon the arrangement of these five elements:

Teachers' Interview:

Introduction to teachers: Thank you for offering to talk with me about your high school program, _____ I am grateful to have you contribute your own unique ideas about students' individual differences to my study. Teachers' ideas about current high school programs are critical for me to understand if I am to help develop relevant curriculum for today's high school students.

Your name and the school's name will be changed in the study - so you will remain anonymous on every page. Any audio tapes will be destroyed as soon as the document is completed. You will be given an opportunity to read the document, and will be able to identify yourself through the pseudonym provided for your identity _____ (add pseudonym here). Since curriculum is usually made up of: time; space; authority; subject matter; and people, questions will focus on these five main components. If you do not understand the question, please ask me to clarify. There are no correct or incorrect answers, since I am interested in your own unique ideas about the current high school practice.

A). Questions re: *time*:

- 1). What might be some individual students' abilities that could be developed through an average (add subject) class?
- 2). How much time do you spend on _____ classes?
(name the abilities mentioned above) in most (name subject)
- 3). How could time be divided in your (add subject) classes so that these _____ (name the abilities suggested),
could be further developed in high school?

B). Questions re: *space*:

- 1). Would you please describe for me, the classroom, or meeting place
for (add subject)?
- 2). Is this room, or meeting place adequate for your students' development of _____ (name the stated
students' abilities)?
- 3). Does this area differ from places where other high school subjects are taught?

4). What conditions might be added or taken away from this environment in order to maximize your students' potentials in (add subject) class?

C). Questions re: **authority**:

- 1). Who is most responsible for (add subject) knowledge your students learn?
- 2). Who decides how they learn it?
- 3). If you could shift the authority around, so that students could better develop their own personal abilities, how would you change (add subject)?
- 4). What you do believe is the extent of students' authority to develop their own uniqueness in (add subject) ?

D). Questions re: **subject matter**:

- 1). What are the major topics students have learned about in (add subject) class?
- 2). Of these topics, which allow your students to most use their _____ (name the earlier stated students' abilities)?
- 3). What topics or activities would you add to the (add subject) program in order to maximize your students' highest individual abilities?

E). Questions re: **people**:

- 1). What people contribute most to your (add subject) class?
- 2). How would you describe the role of these people involved?
- 3). Who else would you ask to participate in the program, in order to develop your students' highest individual abilities?

These interview questions are merely a guide into an informal conversation between the participant and researcher. My intent, as demonstrated by the questions is to identify students' and teachers' perceptions of individual differences, and to explore how these different abilities are addressed in current high school curricular structures, since it is held that curricular organization directly impacts on classroom instruction. My major concern is to identify and describe both student differences, and curricular structures through the:

Research question: *How do the curriculum structures (i.e. the time, space, authority, subject matter and people) in one urban alternative school, address individual student differences?*

These interview questions represent an attempt to "get at" each of the five basic components of curriculum structure, since a school's curricular organization is dependent upon the arrangement of these five elements:

Students' Interview:

Introduction to students: Thank you for offering to talk with me about your Grade ? (name the subject) program, _____ (add students name). My name is Ellen Weber, and I am completing my PhD program at UBC, where I am interested in how Vancouver high schools consider your individual differences and abilities, in school. That's why I am grateful to have you contribute your own unique ideas to my study. I especially enjoy high school students to participate with me, since your ideas about high school programs are critical for me to know if I am to write relevant curriculum for you to study.

Your names and the school's name will be changed in the study - so you will remain anonymous on every page. Any audio tapes will be destroyed as soon as the document is completed. You will be given an opportunity to read the document, and will be able to identify yourself through the pseudonym that you provide for your identity _____ (add pseudonym here). Since curriculum is usually made up of: time; space; authority; subject matter; and people, questions will focus on these five main components. If you do not understand the question, please ask me to clarify. There are no correct or incorrect answers, since I am interested in the individuality that you bring to your (add subject) class.

A). Questions re: *time*:

- 1). What are your greatest abilities? In which specific activities do you _____ most excel in?
- 2). How much time do you spend on _____
(name the abilities mentioned above) in most (add subject) classes?
- 3). How could time be divided in your (add subject) classes so that _____ your
(name the stated best abilities and potentials),
could be developed in school?

B). Questions re: *space*:

- 1). Would you please describe for me, the classroom, or meeting place _____ for
(add subject) ?
- 2). Is this room, or meeting place adequate for your development of _____
(name the student's stated ability)?
- 3). Does this room differ from other high school subjects taught?
- 4). What conditions might be added or taken away from this environment _____ in
order to maximize your personal potentials in (add subject) class?

C). Questions re: *authority*:

- 1). Who is most responsible for (add subject) knowledge you learn?
- 2). Who decides how you learn it?

3). If you could shift the authority around, so that you can develop your own personal abilities, how would you change (add subject) ?

4). What you do believe is the extent of your authority to develop your own uniqueness in (add subject) ?

D). Questions re: **subject matter**:

1). What are the topics you have learned about in (add subject) class?

2). Of these topics, which allow you to use your _____
(name the student's stated ability)?

3). What topics or activities would you add to the (add subject) program in order to maximize your highest abilities?

E). Questions re: **people**:

1). What people contribute most to your (add subject) class?

2). How would you describe the role of the people involved?

3). Who would you ask to participate in the program, in order to develop your highest abilities?

Appendix C

PROCESSES C. Sample Activity Sheet for Individual Projects

UNIT: _____

ACTIVITY SHEET

NAME: _____

INTERDISCIPLINARY TOPIC: _____

GUIDING QUESTION: _____

AIM: _____

MATERIALS/RESOURCES _____

EVALUATION:

Appendix DD. Sample Activity Sheet for Student Identification of Intelligences

Intelligence	Professional Use	Personal Use	Total
Logical/ Mathematical			
Verbal/ Linguistic			
Visual/ Spatial			
Bodily/ Kinesthetic			
Musical			
Interpersonal			
Intrapersonal			

Appendix E


BOARD OF SCHOOL TRUSTEES OF SCHOOL DISTRICT NO. 39 (VANCOUVER)

1595 WEST 10th AVENUE, VANCOUVER, B.C. V6J 1Z8 TELEPHONE (604) 731-5248 FAX 736-8584

STUDENT ASSESSMENT AND RESEARCH

1992 November 4

Ms. Ellen Weber
 2621 Tennis Crescent
 Vancouver, B.C.
 V6T 2C1

Dear Ms. Weber:

I am pleased to advise that your research proposal, "Multiple Intelligence Theory as a Generative Model for High School Curricular Organization," has been approved for implementation in the Vancouver school system.

As a condition of Vancouver School Board approval, please plan to submit a copy of your doctoral dissertation to this office upon its completion. Best wishes for success with your project.

Sincerely yours,

Sharon Reid
 Supervisor of Educational Research
 Student Assessment and Research

/lb

cc Dianne Good, District Principal, Student Assessment and Research

MEMO Ellen Weber - Tuesday, November 10, 1992.

Overview of the Initial Research Phase

Workshop to Discuss MI Theory Implications for High School Curriculum Structure

The purpose of the first workshop with high school teachers, the head of the English department, and the researcher was mainly to establish a collaborative inquiry, and to clarify the term "collaboration" within this specific context (Erickson, 1991). That is, we addressed the specific collaborative relationships that might be formed in order to exemplify our current research project, which is to examine current curricular structures in this particular high school, and to modify these structures in order to address student individual differences.

I began with an invitation for each staff member to describe this high school's curricular organization (i.e. how is time, space, authority, subject matter and people structured). We then discussed ideas for change that the teachers and administration generated. In this way, we began the project by working together in a cooperative manner, by contributing notions of limitations and providing suggestions towards restructuring the present organization. This overarching common purpose - to collaboratively examine the school's present curriculum design, and our subsequent attempt toward redesigning the curriculum structure, would be guided by our efforts to address the diverse intelligences of each student.

Following the expressed perceptions and ideas of each participant, I provided a brief overview of Howard Gardner's Multiple Intelligences Theory (MI), as MI Theory might provide a common theoretical framework to define student individual differences. At this time, I described my research interests, in order to determine if my research project might fit the change in process at this alternative urban high school.

The school-based project was defined as having three broad aims:

1. The establishment of a functional and collaborative research group with practicing high school teachers, administrator, students, and researcher.
2. The development and documentation of a Multiple Intelligence teaching perspective in one alternative high school setting.
3. A description of student and teacher perceptions of their classroom practices before, during and after MI Theory implementation.

In accordance with the research findings of Erickson (1991), that teachers must construct for themselves a repertoire of diagnostic techniques and teaching strategies that will allow them to respond to the uniqueness and complexity of their practice setting, I initially invited participant discussion that would engage teachers in a communication of their practice. This sharing took place prior to

my provision of knowledge from Howard Gardner's MI Theory, and influenced the ideas and possibilities generated by the theory itself. In other words, teacher generated knowledge took precedence over theory generated knowledge and teacher contributions helped to establish and define the theoretical framework of this project, as did MI Theory.

MEMO

TO: Deleted teachers names

FROM: Ellen Weber

DATE: November 17, 1992 (2:00 p.m.)

RE: Your collective set of questions and our upcoming meeting.

Ellen Weber - Tuesday, November 17, 1992.

Many thanks for the faxed questions. Their depth and breadth made me wish my own name was Howard Gardner - in order just to skim the surface in an authentic response. They are actually questions I too had, and a few of them I have already put to Dr. Gardner at Harvard.

Your detailed questions sparked some ideas for a possible unit we might be able to construct together. I will share these ideas at our upcoming meeting, on November 23, Monday at 3:30.

Also - good news! I was just invited to speak on MI theory as it applies to high school curriculum organization - at Seattle University on Dec. 10th. The good news is that one of the other speakers has already begun to restructure an entire high school district around the 7 intelligences and the area is apparently quite near B.C. I will meet several other curriculum developers and perhaps will be able to locate a site that will be possible for us (or me) to visit, and other high school educators who have common goals, with whom to share application ideas (if we wish).

I look forward to our next meet and to a more concentrated time of possibly locating together a common direction. Thank you for getting the questions to me in time for me to think, consult, and prepare some concrete application illustrations before our next meeting.

Regards,

Ellen Weber

MEMO

TO: Deleted teachers' names

FROM: Ellen Weber

DATE: November 22, 1992

RE: Our upcoming meeting at 3:30 - 5:30, Monday, Nov. 23. I see this project as one that begins now, is implemented during January - with a possible display of our projects to the community in the beginning of Feb. - and an assessment of our efforts in March. If we agree on the process, we may at that time wish to begin our second theme at that time.

(Deleted head teacher's name), here is an agenda that I have put together based on the questions you sent, and our progression together. I will bring copies of several helpful materials and this agenda for teachers, if it meets with your approval.

Monday, Nov. 23, 1992 -3:30 - 5:30P.M.

This agenda, for our 2nd meeting was written to help focus our meeting in order to progress further in our work together. It is in no way a complete agenda, and invites every opportunity for each person's input or alterations.

- 1). Introduce Dr. Gaalen Erickson (UBC Supervisor and invite Gaalen's input).
- 2). John Goodlad in his school/university partnerships addressed the importance of recognizing competing interests and purposes in collaboration. What exactly will each of our roles in Templeton project be? The students' roles? Community roles? I see my role as:
 - 1). contact person for resources
 - 2). work together with a student photographer in opening communications (and hopefully resources) through reporting to both the educational community (through Educational Leadership, and the Vancouver community through the Vancouver Sun).
 - 3). Meet with you regularly at (deleted school name) to work together on the project.
 - 4). Document our efforts.
 - 5). Work with individual students or teachers as I am able or invited.

My own agenda:

- 1). To interview two students (of various abilities) from each teacher (8 students) Preferably 4 boys - 4 girls. (One student could be my photographer)

- 2). To interview each of you once at the project's start, once during implementation, and once at the conclusion.
- 3). To perhaps develop a model for implementation of MI Theory at the High School level.
- 3). Interest inventories.
- 4). Looking at MI Theory's suggested four factors in Educational Reform:
 - 1). Assessment
 - 2). Curriculum
 - 3). Teacher Education
 - 4). Community participation
- 5). Division of teacher generated questions into three categories.
- 6). Decide on a theme and a timeline for implementing the project.
- 7). Other _____
- 8). Suggested preparations for next meeting:
 - 1). Have student generated questions on our theme.
 - 2). Have input from the community on the theme.
 - 3). Begin to build a bank of ideas and activities for actual teaching of 7 intelligences

Finally - Dr. Howard Garner in a letter to me, dated, Nov. 3, 1992 said: "*Folks have some good ideas about MI in the early years, perhaps through middle childhood. But the royal road for MI at the high school level remains to be charted - - I look to you for leadership in this area.*"

Please feel free to contact me if I can assist you in any way. (228 - 8999). Ellen

Regards,

Ellen Weber

Also, I have categorized all questions into three categories so they can guide our discussion and progress throughout our project. On Monday, I will bring copies of these categorized questions for each teacher and suggest ways of using them to guide our collaborative efforts toward implementing a unit together. (For a list of questions see Appendix A)

In addition I have constructed an interest inventory - which could be ready for use in order to get students involved from the onset of our project.



University of British Columbia

Ellen Weber (CSCI), Faculty of Education

2621 Tennis Cres, Van., B.C. V6T 2C1

MEMO

TO:

FROM: Ellen Weber

DATE: December 4, 1992

RE: Our upcoming meeting at 3:30 - 5:30, Tues, Dec. 8. *None* something you spoke at our last meeting opened my understanding to how mandated curriculum does not in any way conflict with our collaborated interdisciplinary study approach to Howard Gardner's Multiple Intelligence Theory.

Here is what you said - and how I applied your contribution:

Mandated curriculum in high school may appear to conflict with the notion of interdisciplinary studies, unless one views mandated curriculum as a "springboard" (*None*) into deeper understandings as well as into addressing individual student differences!

How then does mandated curriculum provide such a springboard? One illustration comes from the following springboard from a proposed lesson on: *The Industrial Revolution*. Students might be hooked or provided this advanced organizer (springboard) into both individual differences, and deeper understandings:

Teacher's unit introduction: (Provides the initial springboard) The Industrial Revolution refers to a time in Britain from the middle of the 18 Century to the middle of the 19 Century. Inventions of technology created the factory system of large scale machines to replace simple farm and labor practices. Farmers often left their fields to move into cities and many people grew richer by working in these urban factory centers. With great agricultural improvements came also poor working conditions for many women and children who formed much of the work task in large factories.

The above springboard now requires student and teacher and community questions related to the theme POWER, as a take off or leap into deeper understandings on this topic.

Five steps that might frame such a springboard approach include:

- 1). Look at an overhaed or visual display of the seven intelligences, and ask students to come up with questions that would activate each of the 7 intelligences on this topic of Power and the industrial Revolution. Encourage students to consider their own strengths (music, kinesthetic etc.) and to pose related questions.
- 2). Brainstorm with other teachers for a broader perspective on key issues.
- 3). Invite students to complete an interest inventory that might indicate what their interests are, and to complete an activity sheet for some interest they wish to pursue further.
- 4). Categorize questions under mandated curriculum springboard to complete your instructional approach to this unit.
- 5). Have students begin to discuss their interests and curiosities, and collaborate on methods of data collection for these inquiries.

Using such a **springboard approach** - one covers mandated curriculum, as well as address the interdisciplinary topics and student differences.

At our Tuesday meeting, I will bring some excellent, and applicational articles on specific intelligences and their education. Also, I will bring the remainder of our initial questions that have not been discussed. Have a good weekend. Ellen.

Third Workshop, Dec 13, 1993:

The Integrated topics are Grade 8 (LIGHT), grade 9 (POWER), and grade 10 (ENERGY)

A Ten Phase Process to Developing a Grade Nine Interdisciplinary Unit on the Theme POWER, and based on Howard Gardner's Multiple Intelligence Theory.

This brief step-by-step approach to planning and implementing one unit in grade nine is intended to act as a tool that will provide examples for teachers to construct their own interdisciplinary units. In no way is the suggested plan meant as a heuristic that will act as panacea for all high school change. It is, however intended to disseminate accepted theories and make applications into one grade nine unit that is expected to require at least a month from planning to evaluation. The process is hopefully another teacher aid, that will reflect some of the key components of Year 2000 recommendations at the high school level.

The ten stages of our implementation plan include the following process:

- 1). Facilitate student input from the initial preparation stages.
- 2). Introduce the notion of multiple intelligences.
- 3). Introduce student interest inventories on the unit topic.
- 4). Categorize the ideas and key questions presented into Yr. 2000 Strands.
- 5). Invite ideas from parents regarding their children and the unit itself.
- 6). Review and record data on each student.
- 7). Present assessment criteria to the class.
- 8). Collaborate with other subject teachers on students' projects.
- 9). Display and present students' work
- 10). Videotape and file the completed tests.

In this brief unit outline, each of the above ten stages is described and illustrated. Teachers are invited to make use of any materials from this booklet, such as the interest inventories and other charts included - especially prepared for teacher use. First, however, a background sketch of Multiple Intelligence Beginnings may be useful.

Multiple intelligence beginnings

Howard Gardner, of Harvard University comes from a developmental psychology background. Discrepancies between Binet's original intelligence test, published in the 1920s, and what we now know about the way in which people learn, raised new challenges to develop teaching materials based on modern learning theories. Just as we would not expect a hospital to look the same today, with technological advancement, so we might expect that schools will change to reflect new understandings about learning processes. Gardner works with two groups of people, normal and gifted students at Harvard, as well as people who were normal but suffered brain strokes.

He noticed that depending where the brain lesion was located in a stroke, determines what specific intelligence is lost. From studies over 20 years, Gardner came up with a theory that suggests certain sections of the brain govern several different and entirely distinct intelligences.

A Dutch Organization offered funds to Harvard group to conduct a study that would tell them more about *human potential*. Gardner's task was to report on cognition. That study led him to write Frames of Mind, in which he explored the many kinds of competencies. Gardner opposes Samuel Johnston's notion of g intelligence (or general intelligence), and claims that each normal person has at least 7 intelligences, all of which are autonomous. Moreover, none of these are pre-eminent, although persons have varying combinations of all. Gardner defines intelligence as: *The ability to solve a problem or fashion a product that is valued in at least one culture or community*. Culture provides an opportunity to use your intelligence (or achievement). For example, Bobby Fisher, perhaps the greatest chess player who will ever live, but just be another average person, if our culture had never offered chess in which he could excel. While Piaget claimed he was studying all the intelligences, according to Gardner, Piaget was really studying only logical mathematics (one of the seven intelligences believed to be innate within all normal human beings).

Howard Gardner's Multiple Intelligence Theory

The Seven Intelligences:

Logical Mathematical - includes scientific or mathematic ability - with sensitivity to, and capacity to discern logical or numerical patterns; ability to handle long chains of reasoning.

Linguistic - includes poetic or journalistic ability, with sensitivity to the sounds, rhythms and meanings of words and the different functions of languages.

Musical - includes composition and violinist abilities with ability to produce and appreciate rhythm, pitch and timbre; appreciation of the forms of musical expressiveness.

Spatial - includes navigator's and sculpture's abilities with capacities to perceive the visual-spatial world accurately and to perform transformations of one's initial perceptions.

Bodily-kinesthetic - includes dancing and athletic abilities and the ability to control one's body movements and to handle objects skillfully.

Interpersonal - includes a therapist's or salesperson's capacities to discern and respond appropriately to the moods, temperaments, motivations, and desires of other people.

Intrapersonal - includes detailed and accurate self-knowledge with access to one's own feelings and the ability to discriminate among them and to draw upon them to guide behaviour; along with knowledge of one's own strengths, weaknesses, desires and intelligences.

Suggested ten-phase process from planing, to implementation, and evaluation of the unit :

PHASE ONE: Gather a collective perspective of students' interests and abilities:

If you brainstorm with students for ideas about the notion of power as the students understand it, you will see what they know, are interested in, and do not know. You will probably receive responses similar to those below. Students may make mind maps, at this stage, using graphic icons for the different notions that arise, (see figure 1.1) or you could simply list their ideas as they appear below. The important aspect here, is to invite students to put forward their meaningful contributions in the earliest curriculum preparation stages.

POWER: (brainstorming for ideas and questions)

- ability to do or act
- authority
- success at school
- a person or thing possessing authority
- a power station is a building where electrical power is generated
- can be a specific act ie: the power of hearing
- vigor
- force
- influence
- the ability to control others
- the person in control of others
- legal authority
- physical force or energy, ie. electric power
- the capacity to exert force in terms of the rate of its use, ie. 60-watt power
- a nation that has influence over other nations, ie. the big powers
- national might or political strength
- a Spirit or Divinity
- the product of the multiplication of a quantity by itself, ie. 32 is the 5th power of 2 (2⁵)
- the degree of magnification of a lens or microscope etc.
- operated by electricity, ie. power tools

- served by an auxiliary, engine driven system that reduces the effort of the operation, ie. power steering in an automobile
- power of attorney - written statement legally authorizing one person to act for another
- power politics - international political relations in which each nation attempts to advance its interests by using military force or the threat of it.
- the power of the pen
- musical greatness
- orchestras that combine to add new dimensions to their music
- messages put out through music
- pulse, loudness and softness in music - the pause
- greatness
- technology
- empower a student
- brute force
- power-dive (fly, spurt, decent)
- power behind the throne (influence of those behind power figure)
- mechanical power versus human power
- mandated power
- powerful (loud, compelling, notable, vigorous)
- power line (electronics)
- power of speech (eloquence)
- power of the purse (finance)
- power pack (electronics)
- power politics (selfishness)
- powers of darkness (devil)
- power of Light (God)
- power vacuum (impotence)
- power of the people (anarchy)
- physical power - (dance, sports, aerobics)
- power of a group - multicultural gifts

OPPOSITE OF POWER:

- poverty
- powerless
- weak
- inert
- unimportant

Quotes:

"Absolute power corrupts absolutely" 615:15
 absolute power over wives 392:9
 accord women equal power 578:6
 balance of power 328:20682:8, 902:11
 believe source of power is the sky 151:5
 black power 914:n2 and 15

certainty of power 860:7
 commitments of power of balance 813:11
 community of power 682:8
 corridors of power 865:19
 corrupts poetry cleanses 891:16

The above references on power and powerlessness can be located (along with hundreds more springboard quotations into ideas for students in each of the intelligences) in *Bartlett's Familiar Quotations* (p. 1345 to 1346). Perhaps one or two students who may wish to learn typing could type these out for reference sake. Students may build a reference bank for the classroom, and use their research skills to create and illustrate. Or you may construct a bulletin board of ideas for each intelligence - using quotes and brainstorming ideas. (See figure 1.2)

What about the novel (*The Power and the Glory*) by G. Greene (1940)? Are there connections to the times of religious persecution in the name of revolution in Mexico in 1938 and ethnic persecutions today? And whose power is at stake? Who is winning? Who will lose? Why? How can the balance of power be shifted? Or can it?

This brainstorming and discussion session provides a critical foundation for the project, since it draws students into initial building blocks. It is your key into students' interests, prior knowledge concerning the notion of *power* and a general sense of their collective intellectual abilities. Since this unit will emphasize student individual differences, however, you will want to discover more individual information in order to help student develop at their own capacity, and using their particular strengths.

PHASE Two: Introduce the Concept of Seven Intelligences

Introduce the concept of seven intelligences to students, in such a way that shows them how your school is willing to accept and reward more of their intelligences, and appreciate their individual differences. You may wish to give students copies of the illustration in figure 1.2 or place diagram on an overhead or bulletin display.

PHASE THREE: Discover Student Differences through Interest Inventories.

After a lively discussion - with input from students on these intelligences - pass out interest inventories (see figure 1.3) and ask students to fill out and pass in (at least 1/2 hour will be needed for quality detailed responses).

PHASE FOUR Categorize your topics and ideas under the appropriate Year 2000 Strands.

Place your theme (see figure 1.4) on an overhead, with Year 2000 Curriculum Strands as titles, and ask students to provide questions under your own particular disciplines. You may wish to compare these with other teachers and to exchange ideas for each of the 7 intelligences at this stage. Be careful to include any mandates from the province-wide curriculum guide at this stage. But student and parent ideas should also find a prominent place in each category. Invite students to keep all seven intelligences in mind as you move through the list of questions, ideas, and concepts.

For the actual teaching of concepts related to power, you will want to consult your grade nine curriculum mandates for one particular unit that would include power. For example mathematics topics in grade nine (Addison-Wesley) would include: (i) Arithmetic Fundamentals (ii) Ratio and Proportion (iii) Operations with Positive and Negative Numbers (iv) Algebra - Working with Variables (v) Ratio, Proportion and Rate (vi) Solving Equations and Inequalities (vii) Problem Solving (viii) Polynomials (ix) Graphing Linear Equations (x) Geometry (xi) Computer Enriched Mathematics (xii) Statistics and Probability ..

Similarly, Science in grade nine would include such mandated topics as: **The Solar System, The Universe: Changes in Matter, Safety, Reactions, Symbols; Changes in the Environment, Earth Forces, Fossil Fuels, Ecology and Resource Management, A topic in Resources; Energy, Renewable and non-renewable Energy, Energy Calculations, Life Functions, Body Systems, Nutrition.**

Social Studies would build on the themes from texts: Exploration Canada, Patterns of Civilization II, Oxford School Atlas (5th ed.), Hosford Study Atlas. Mandated themes in grade nine Social Studies include: (i) Geography/mapping (ii) Nation Building and Social Order (iii) Industrial Revolution (iv) Other Revolutions - the American and French (v) History of Canada from Native to European Cultures (vi) Current Events and Developments.

In the same way teachers would identify themes they propose to cover. One theme - that would best suit the school theme, and build on prior knowledge would then be chosen. For teaching purposes on selected themes teachers may wish to use a scope and sequence set of questions from those raised by students and parents. Keeping in mind the many learning styles of students, Bloom's Taxonomy Approach to problem solving could be useful. See the sample chart in the appendix 1 at the end of this booklet.

You will also find a sample Interdisciplinary Concept Model on the theme of World Hunger (appendix 2) at the back.

PHASE FIVE: Invite Parents' Contribution By Filling Out Inventories on Students.

Hand out additional inventories for students to invite their parents (or an adult close to them) to fill out comments concerning their individual differences. Asking for care givers perceptions of your students' interests, and abilities provides another way to meaningfully involve the community in school life. (See appendix 2). A good idea would be to ask your students to have their parents provide questions (or input) on their theme. You may also ask them for interesting speakers under discussions that arise as another means of involving community in the project.

PHASE SIX: Identify Individual Student Differences, and Record a Few Notes for Project Preparation Ideas.

After collecting this information you have your data for compiling each teaching unit under your particular discipline. You can match student and parent input with your curriculum guides, and lesson materials. As part of the project, you may also encourage students to build display posters or ideas on their concepts of their different intelligences, and they might try to show their own preferences here.

MI THEORY DEFINES INTELLIGENCE AS THE ABILITY TO SOLVE PROBLEMS OR FASHION PRODUCTS THAT ARE ACCEPTED BY ONE OR MORE CULTURES. How would you define each student's intelligence, from the evidence you have collected?

MI Theory also states that one way of recognizing and identifying strong intellectual proclivities in each area is the persistence shown by students in activities within that area.

Give each student two activity sheets, (one for rough) and have students pass in a sheet (see figure 1.5) after discussion, brainstorming with peers and teacher, and possibly input from home. Provide a set date to complete their sheets. Explain to students that after one month there will be a project display - with visitors welcome and they will be invited to discuss, defend, debating, describe, or illustrate their individual projects. Show students your criteria for assessing projects, so that they understand expectations.

At this point you may ask what criteria should be expected so that projects are not authentically assessed.

PHASE SEVEN: Discuss and Explain Assessment Criteria to Students.

MI Theory, in recognizing there still exists a fear of projects in some circles due to the 1920s project idea of anything goes, suggests criteria be used for authentic assessment. Evaluation of projects includes:

Criteria for Project Assessment:

- rich contexts
- relate to life beyond school
- display knowledge/skills and understanding
- exhibiting strengths
- encouraging cooperation
- encouraging autobiographical stance on learning
- meaningful end-states
- suitability for interdisciplinary work
- possibilities for original work
- deeper and more rounded contact with teacher

You will want to invite students' questions and ideas on each criteria, so that they know at the beginning of their work, what is expected. You may wish to offer students instructional alternatives at this stage (see figure 1.6).

PHASE EIGHT: Discuss the Students Projects with Other Teachers.

Such collaborative conferencing will enable teachers to begin to develop dimensions of vocabulary for describing the levels of growth. A vocabulary will emerge as teachers sit and review the work together. See figure 1.7 for additional evaluation techniques that could be used here. MI Theory suggests several dimensions for assessing projects, that may generate discussions:

Dimensions for Assessing Projects:

- 1). Conceptualization
- 2). Presentation

- 3). Quality (technique, originality, accuracy)
- 4). Individuality
- 5). Evidence of cooperativeness (this includes cooperativeness with data bases, use of libraries, use of different sources etc.)
- 6). Does the project reflect the curriculum?

Old theories are not supplanted by criticism - but can gradually be supplanted by new theories - It is felt here that MI is one new theory that may help to supplant old ideas.

PHASE NINE: Plan to Display Projects after One Month in a Large Open Area.

The students are now able to discuss and debate their ideas with others. Invite the members of community who helped formulate original ideas in to view and appreciate the students' work. Have students interact with viewers, explaining their work and responding to questions.

PHASE TEN: Videotape the Projects and Place on File.

It is recommended that a library of each child's projects be collected throughout the school years. You may wish to decide collaboratively how these files are gathered. The format will depend on the resources at your disposal and the creative ability of organizers to gather and disseminate the information. Students may wish to get involved in this creative process.

With MI Project method of assessment - students are no longer limited to paper and pencil tests. This method invites a test that is more closely linked to the methods of research and the particular approach of the students' learning styles. In other words, testing will be expanded to include several types of performance-based exams:

Rather than the traditional view of the educational enterprise, which insists on facts on paper, the assessment method used in MI Theory evaluates for deeper understanding. You may wish to compare the two methods below:

Traditional Testing in Grade Nine:

Purpose. Factual mastery (or back to the "basic skills")

The vehicle for evaluation of this enterprise is short answer tests.

2). Improved View of Educational Enterprise:

Purpose. Understanding

The vehicle for evaluating is *performance-based authentic assessment*

What are the vehicles for Authentic Assessment?

These are:

Performance-based exams

Which may be:

- portfolios
- processfolios
- exhibitions
- projects

The test is closely linked to the learning activity. So, for example, if you want a student to analyze data - give that student data and see if the student can place it - relate it, alter it, link it etc. The greatest two barriers to teaching for individual differences, are time and resources. Several high schools in Canada have restructured their schools toward what MI Theory calls "individual-centered schools, which allow for teacher time to work with individual students, and a strong support in that important endeavor. Below is one suggested structure for releasing teachers to work with students' differences.

Individual -Centered Schools:

Three expert roles:

- 1). Assessment specialist (information about kids is fed to 2 brokers).

- 2). Student curriculum broker- who works within the schools to help kids with a particular educational path.
- 3). School community broker- who helps kids map their abilities onto roles within the wider community. This person seeks out mentorships for students, for example.

NB: Gardner ascribes to a required curriculum. Just because people have to learn science, however, Gardner suggests, they should not have to learn in the same way.

David Lazear provides many practical applicational activities that both activate and educate each of the 7 intelligences in his two books, Seven Ways of Knowing, and Seven Ways of Teaching (See references at the end)

YOUR NOTES

December 18, Friday - meeting at Templeton - from 1:00 P.M. until 2:00 P.M.

Officially this meeting was set to gather perspectives from each other as to a common thematic approach for our February unit using MI Theory as a generative model. The concerns raised were that Joanna felt MI Theory may restrict and label students - rather than provide increased opportunities. We discussed the fact that MI Theory promotes at least 7 and infinite additional intelligences, and discussed the use of 7 as manageable for clustering activities and so on. We also wondered how MI Theory would relate with the school's notion of "Autonomous learner" and felt the two easily interacted and complemented one another.

Biggest among our dilemmas was the fact that we are unsure how we can relate the many disciplines toward connecting themes. I will offer Drake's work here to try and document the feelings that teachers' expressed and show what this group went through in a similar process. I feel that the article may in fact clarify some of the struggles we have met.

Also, I had hoped to ask for suggestions about my own data collection, and ask for convenient times to discuss specific issues with individual teachers and their students.

I have had to change the basic perimeters of my study to fit the collaborative direction of the group, and now want to suggest a wide scope for our thoughts. I will tighten up my design and write up my proposal in the next few weeks, but I do have a guiding focus through a roughed out table of contents that I sketched. This may serve as an advanced organizer for me to get your thoughts and ask how I can fit into your schedules. I want to add here that I am willing to be used by any of you as I can support whatever you are doing in the classroom, and I value your insights as I progress.

INTERDISCIPLINARY INTEGRATED THEMATIC STUDY FOR THE UPPER INTERMEDIATE PROGRAM

CONTENTS

April 2, 1993

(Suggestions from Dr. Gaalen Erickson and Ellen Weber concerning the document teachers may write in order to justify a school grant)

A. GENERAL INTRODUCTION

- rationale for interdisciplinary study
- goals of the Year 2000 Document

B. OUR APPROACH

- introduction to interdisciplinary themes
- Light - grade 8
- Power - grade 9
- Change - grade 10

C. PROJECT RESULTS

- students perspective
- teachers perspective

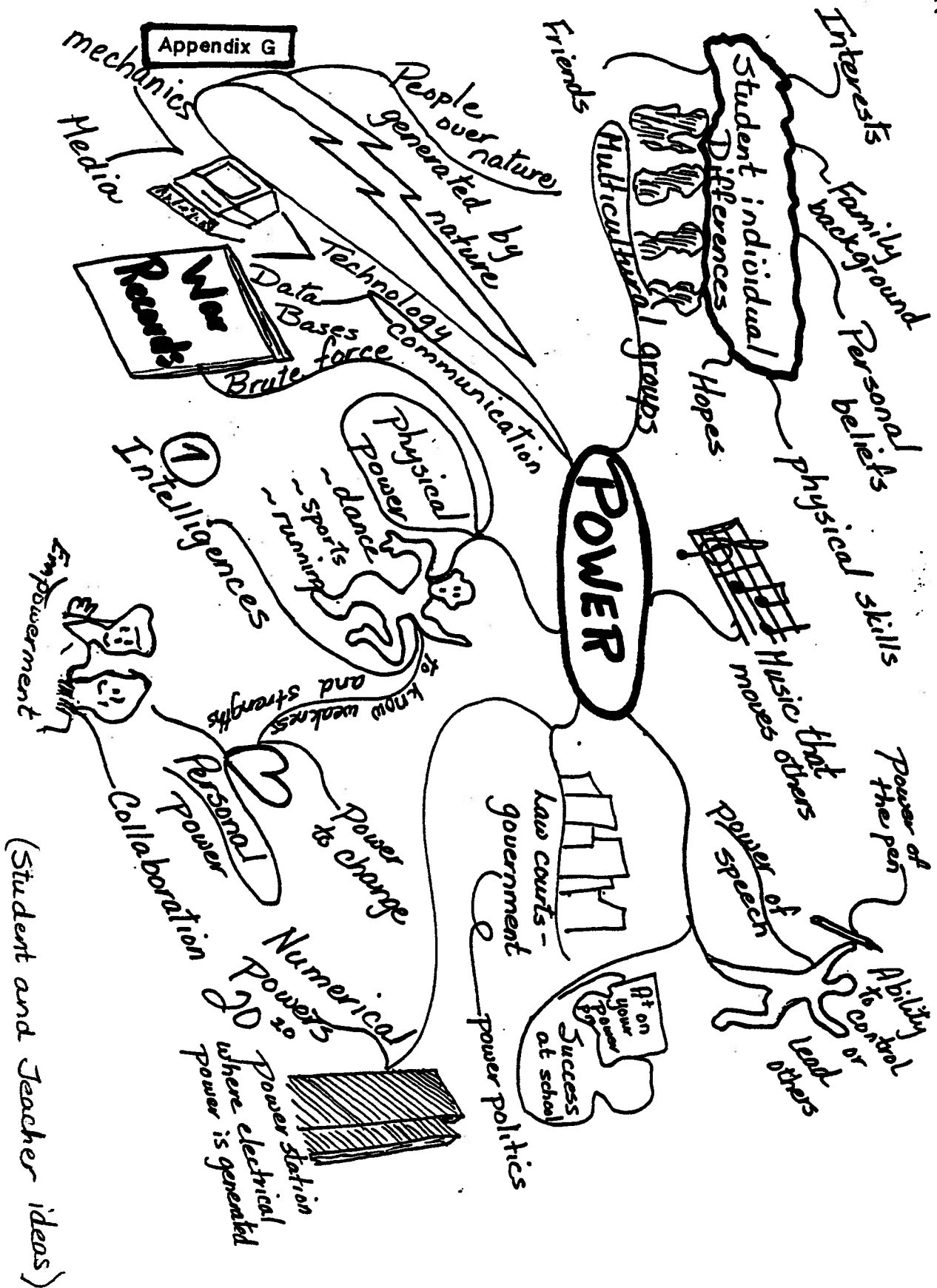
D. CONCLUSION

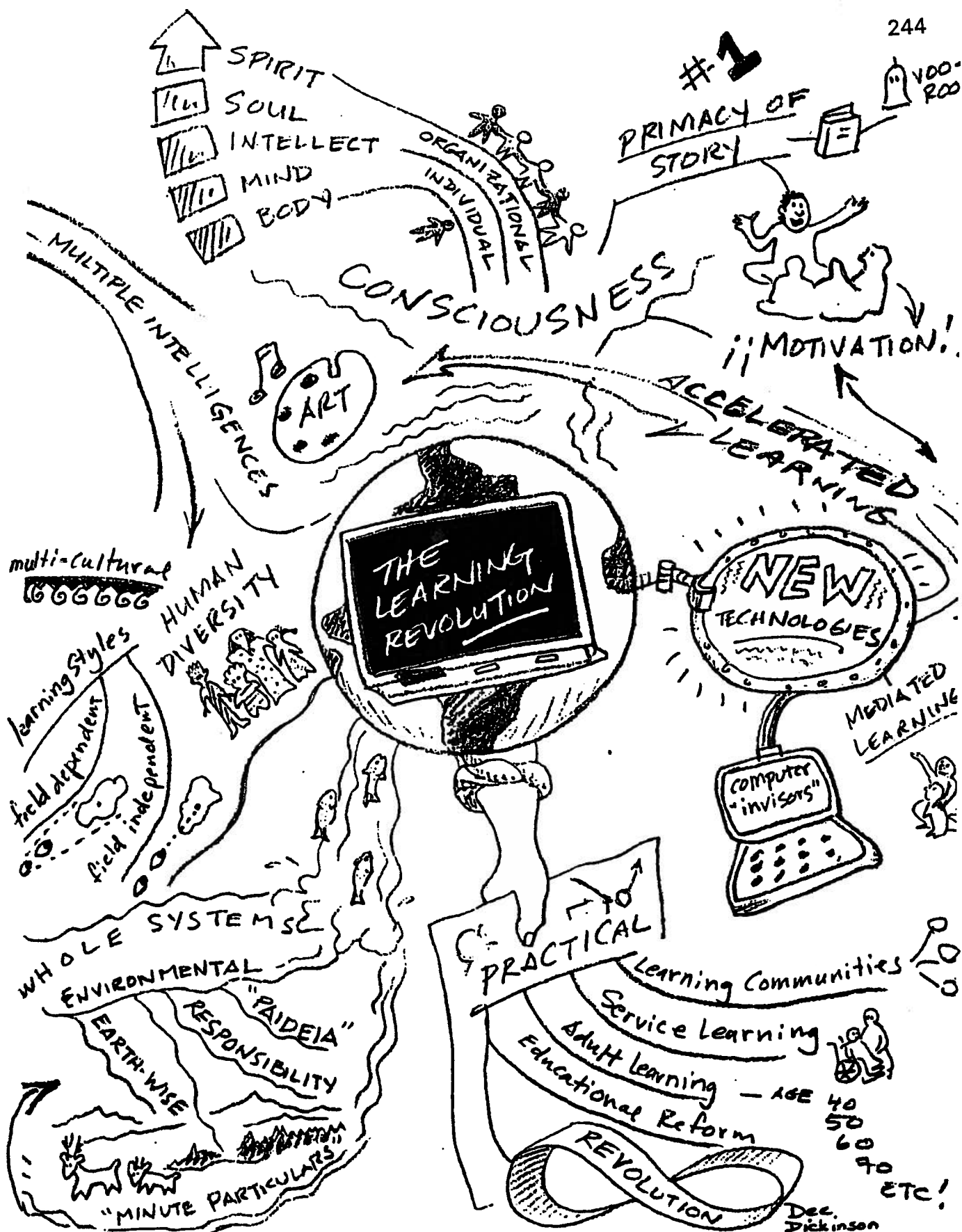
- implications for teachers
 - what have we learned?
 - where do we go from here?

F. REFERENCES

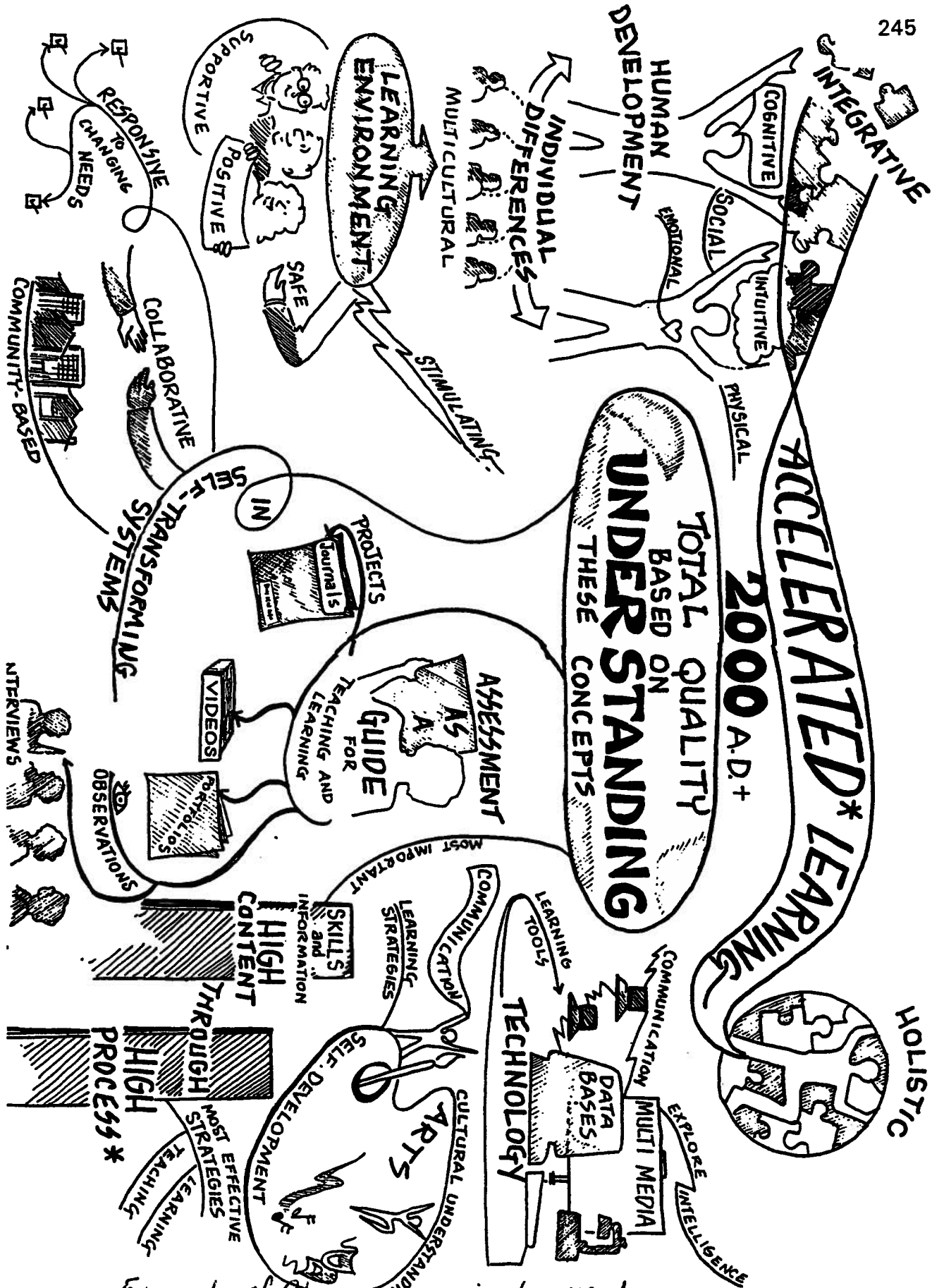
G. APPENDIX

Theories that contributed to the study
Grant application
Budget

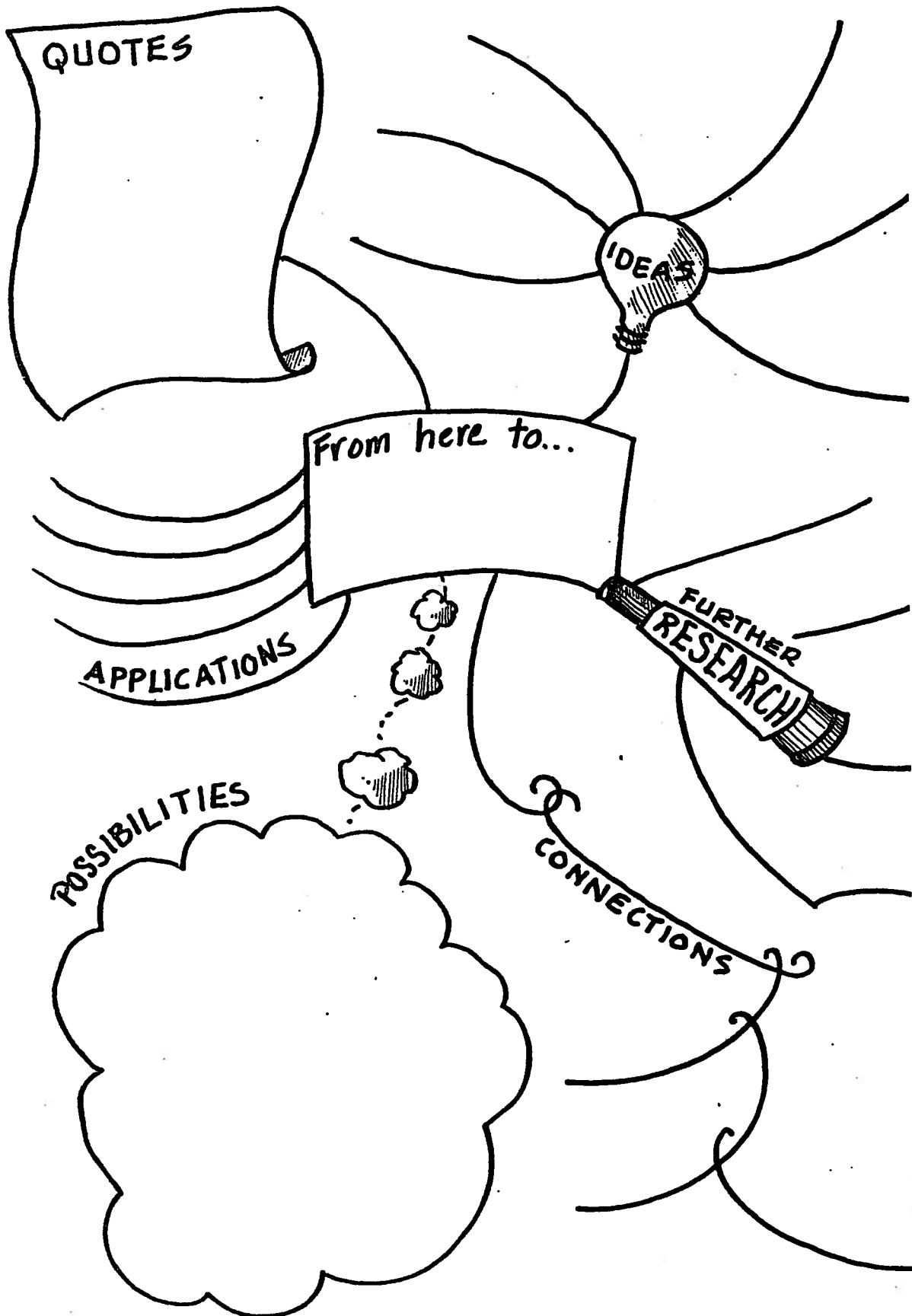


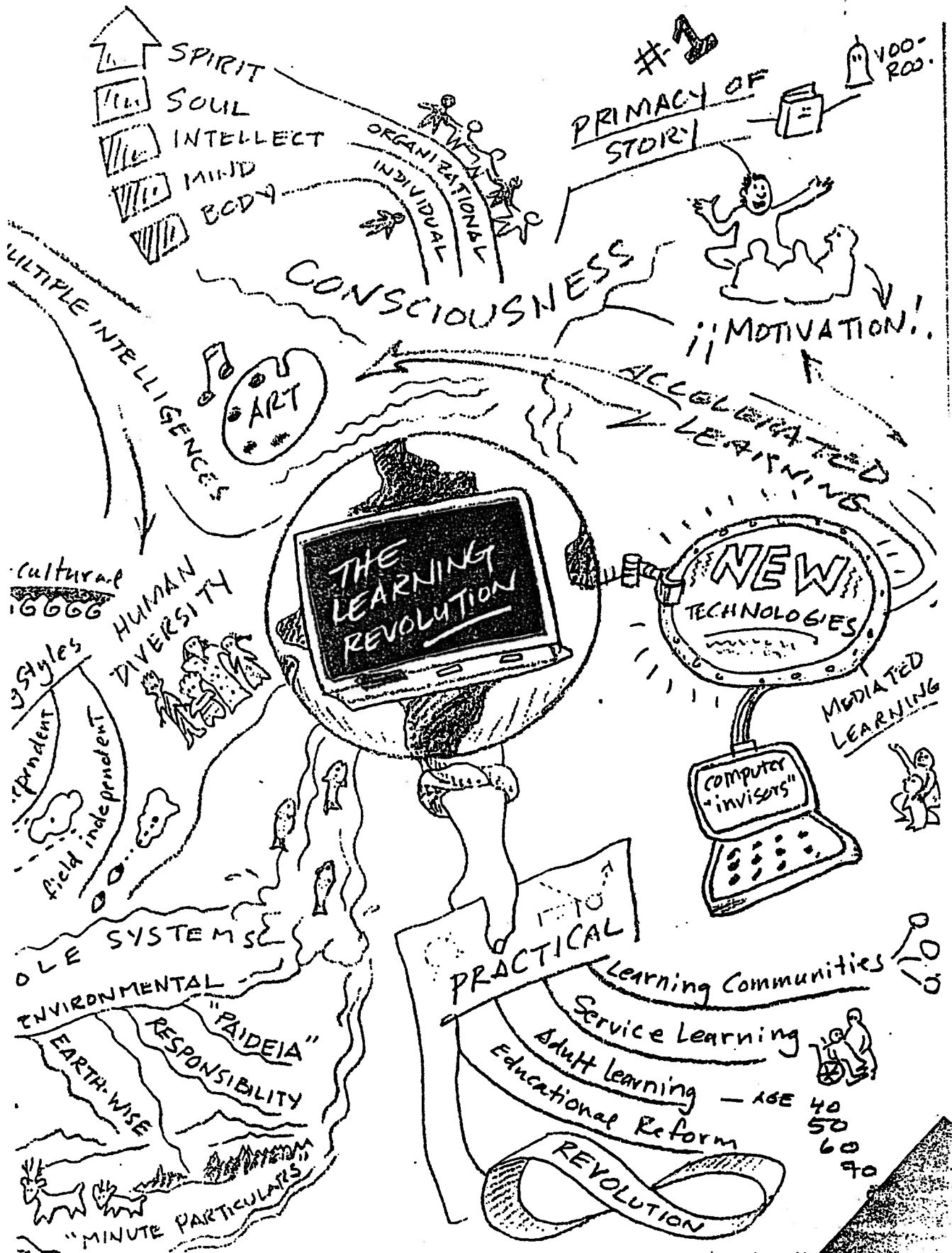


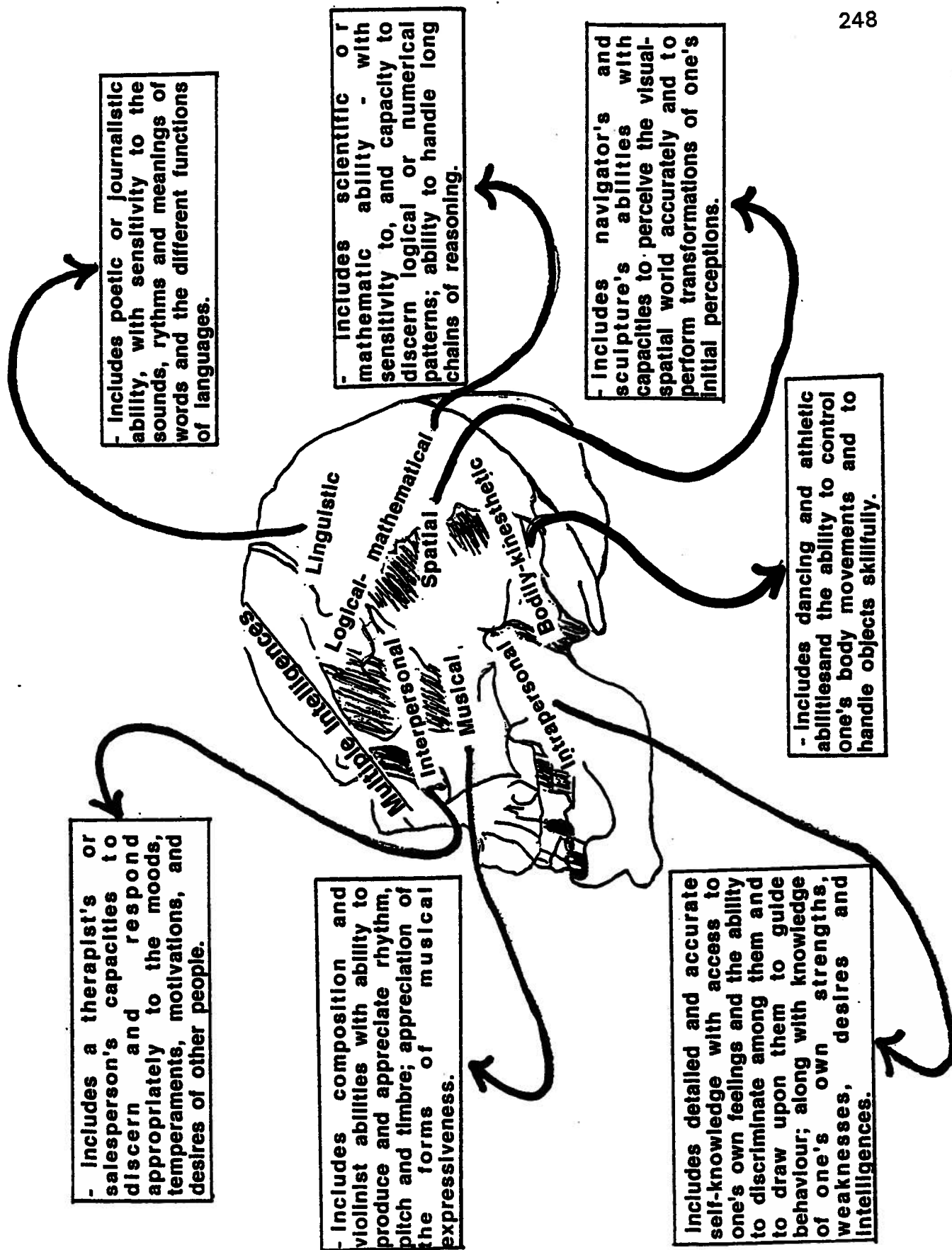
Example of Classroom Visuals Used

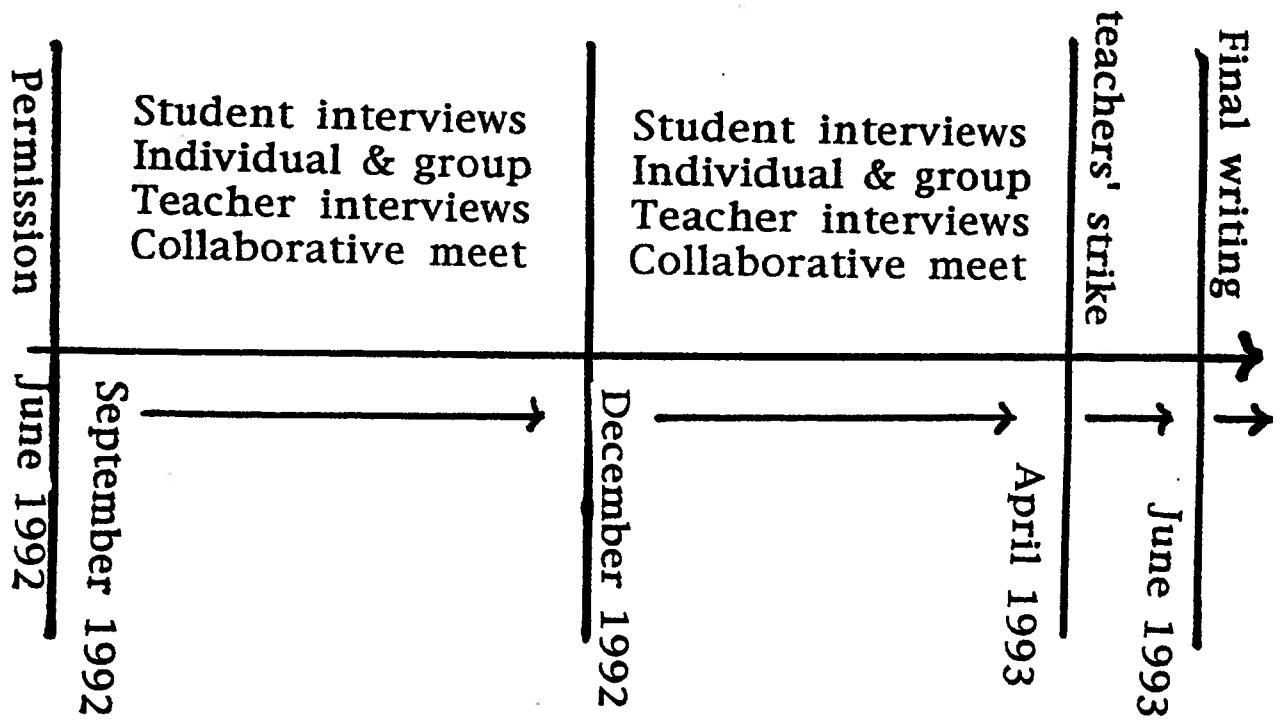


Example of Classroom visuals used







Timeline:

Appendix J -- STUDENTS' PERCEPTION OF INTELLIGENCE

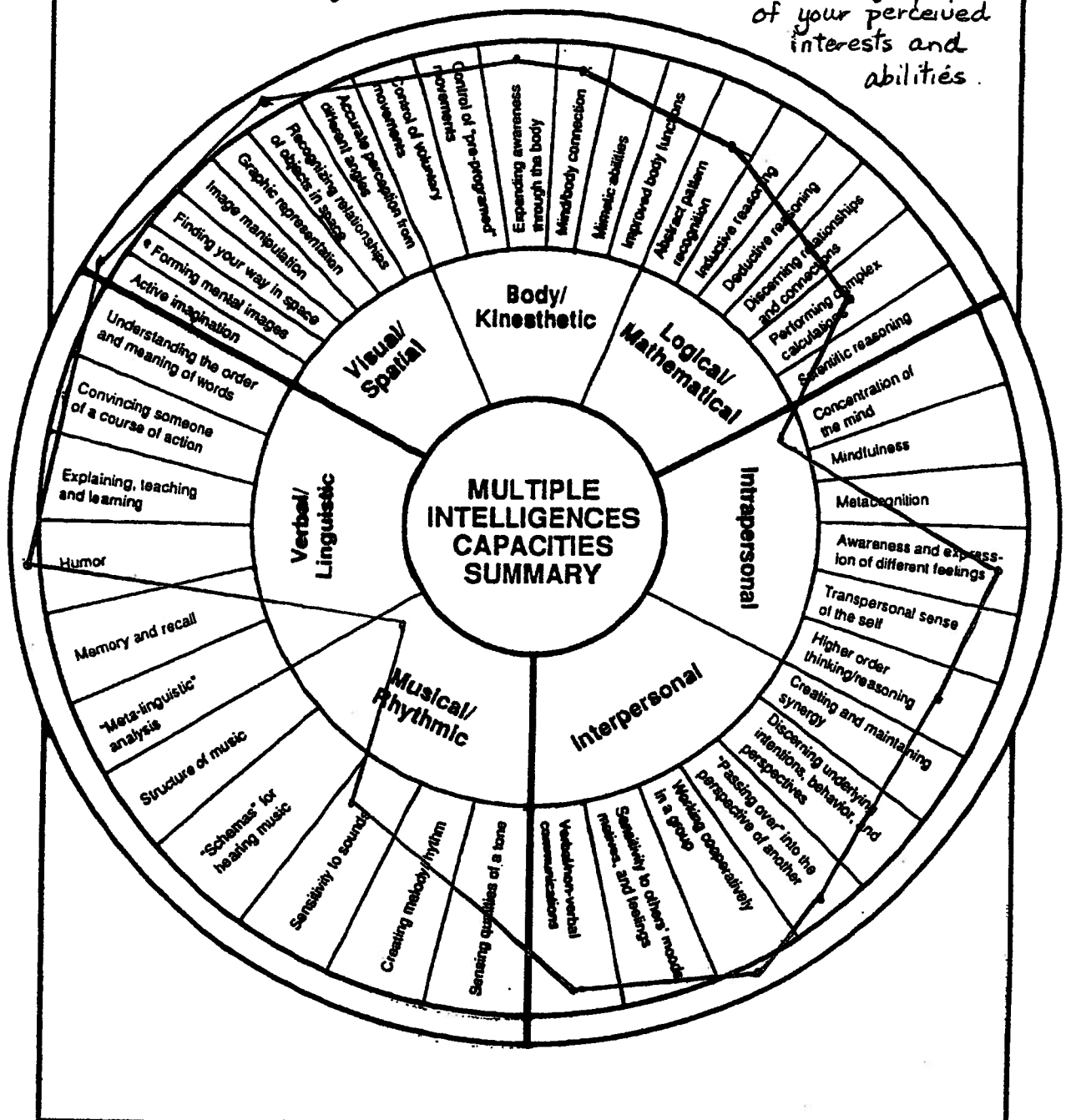
- ① Are there other intelligences you would like to develop?
- ② How have your areas of strength changed from child → adult. Kara
- ③ How might you go about developing other areas of intelligence or interest.

Intelligence	Professional Use	Personal Use	Total
Logical/ Mathematical	- physicist - medicine - scientific research	- grocery shopping (prices) - bills - cheques	
Verbal/ Linguistic	- communications - newscasters - social workers - any job with interacting involved	- telephone - talking to friends - oral participation in school	
Visual/ Spatial	- designer - architect - artist - car designers etc.	- hobby - sketching - card making	
Bodily/ Kinesthetic	- gym teachers! - P.E. jobs - study of the human body - physiotherapy - firemen, ambulance att. - coaches	- sports/recreation - life saving - health - enjoyment - refreshment	
Musical	- musicians - music teachers - recording studios - movie directors (music needed)	- hobby - piano, violin, etc.	
Interpersonal	- any job involving working w/ other people eg. marine biology - social work	- social life - making & keeping friends	
Intrapersonal	- professional - psychologist	- dreaming - plans for future	

- ④ Which intelligences do you feel are most developed in teachers in general?
- ⑤ Complete

Multiple Intelligences Summary Wheel *Sam* 251

Directions: Place a dot in each of the 7 main segments. You may mark any number of the smaller categories also. Join all dots for a rough profile of your perceived interests and abilities.



Appendix K -- MULTIPLE INTELLIGENCE SUMMARY WHEEL

Sam,

Multiple Intelligence Summary Wheel

1). Are there other intelligences you would like to develop?

- ① Yes, there are other intelligences I would like to develop such as the musical section and mathematical section because it will help me in school. The understanding more about the topics would help me raise my academic status and find new perspectives and ways of looking at things.

2). How have your areas of strength changed from childhood to adulthood?

- ② When I was child my strengths were verbal and mathematics because I liked talking in class and with my friends in & out of school but now my strengths are interpersonal, intrapersonal and verbal. ~~I like cooperating~~ I like cooperating with people in groups, getting to know people on a personal basis and I love humor. I want to become a social worker or something else similar to the it.

3). How might you go about developing other areas of intelligence or interests?

- ③ I might join mentorship and focus on the strengths in the with another person. This method would be a good if I ~~had~~ had a problem or question about a certain area, I would be assisted in answering my question and understand why it is so. I could even have a discussion with a teacher in the school or in a university that specializes in the specific area of interest.

4). Which intelligences do you feel are most developed in teachers in general?

- ④ Regarding the teacher - their areas that they are most developed in varies. If the teacher taught in elementary school, the he/she would be specialized in almost or probably all of the different intelligences.

KARA

Multiple Intelligences

- ① Are their other intelligences you would like to develop?
- ② Yes, I would like to improve my logical (mathematical) intelligences and my musical abilities. Both are 'weak' and I would enjoy (at least in music) to 'expand my chances' so to speak.
- How have you areas of strength changed from child → adult?
- ③ No, not really. I always was 'into sports' and if not the actual games then 'frolicking' at recess and lunch in elementary. I always seemed to be (Kara) outside, my sister and I played 'Friend' and 'Kiddies' among other games. As far as the intrapersonal, well I've always been sort of 'imaginative' if you like, and felt that I knew myself pretty well. My family encouraged 'talks' and we used to (not so often anymore) have 'meetings' where we would tell what we liked/disliked or rather what we thought everybody was good at and what we needed work on. I think, if anything my visual and (supposed) 'special' abilities have expanded. I always enjoyed art, drawing, but since highschool I have been a little more serious with it. At least, spent more time on it. I also have created a mini-company, not in reality but just sort of in family & friends of ^{STINE & KARO'S} I started my niece and any other drawing I can dream up for ~~(any other)~~ the occasion. That I didn't develop younger, so I have developed in this area. One other area in which I have 'grown ~~into~~ in to' so to speak is 'verbal/linguistic'. I always talked a lot, having a tendency to open my mouth quite a bit when I should have yipped it up. I am slowly learning to use it for useful purposes and love teaching. My musical intelligences, well... I'm not strong in that field, but my sensitivity I believe has changed. At least, I used to be uninformed as far as knowing about 'the in' stuff' to listen for. I didn't mind loud 'things' all that much. Now it drives me crazy. I just cannot call the billion decibal noise, music. Anyway I can't listen very long to anything, it bothers me, but there are some songs that I only ^{can} listen to once. They would suggest I've changed. Then there is interpersonal, which

is the last topic I'll touch on. I am still learning about it and growing into it. Working with and understanding other people is a delicate and certainly complicated area. Every body's different, thus techniques for talking and learning how to 'know' people must be learned. Patience also is used, of course of which I still need to gain, and control. I'm learning though!

3) How might you go about developing other areas of intelligence or interest

Well Musical I guess I could take up piano again, or as I would like some day, the flute. (P) Composition would be fun and it would teach me a lot. As for as math goes, I think that the major way would be just continue on with math in school and apply it to my day situations (so I would continue using it).

4) Which intelligences do you feel are most developed in teachers in Interpersonal and Verbal would be the two that I generally can see right away. Int. for knowing the students, do they work, what they need (as far as teaching styles and discipline) etc. Verbal for communication and the ability to achieve (or) retention, processing and thinking in students' minds. They would also need (or) Intrapersonal to a degree to be able to look at themselves and analyze all teaching styles, figure out what they're doing 'right' and wrong.

Complete
I did it!

APPENDIX L

MINI SCHOOL INTERDISCIPLINARY PROJECT - 1993

Timeline for Teachers

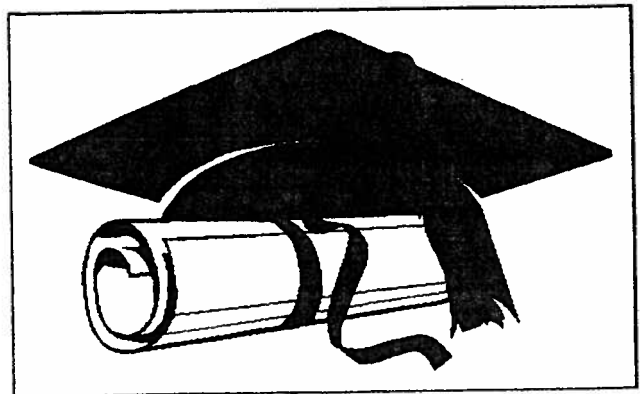
- March 1-5 Introduction of projects to class (GS)
 - timeline
 - list of projects
- March 8-12 Multiple Intelligence / Knowledge Organiser.
 Letters of Intent due.
- March 15-19 Spring Break.
- March 22-26 Time in class - project check up - end of week.
- March 29- April 1 Time in Class- peer feedback (5' presentation).

GRADE	Letters of Intent	Project Checkup	Feedback
	March 8-12	March 25-26	March 29 - April 1
8	Copeland/Stokes	Copeland/Stokes	Copeland/Stokes
9	Kuniss/Hancock	Hancock/Kuniss	Hancock/Kuniss
10	Kuniss/Hancock	Kuniss/Hancock	Kuniss/Hancock

GRADE	Multiple Intelligences	Knowledge Organiser
	March 8-12	March 8-12
8	Hancock	Copeland
9	Stokes	Hancock
10	Kuniss	Stokes

MINI SCHOOL INTERDISCIPLINARY PROJECT - 1993

1. Choose a project involving the theme for the grade
 - a. grade 8 : Light
 - b. grade 9 : Power
 - c. grade 10 : Change
2. Forget the window dressing, what we want is substantive analysis and synthesis involving the different subject areas - English, Math, Science, Socials.
3. Each person must do their own individual project - NO group projects this time.
4. Due Thursday April 15th, 3.30pm, absolutely no extensions. Plan well ahead and budget your time wisely and efficiently.
5. 10% of third term mark in each Mini School subject area English, Math , Science, Socials will be obtained using the results of this project.
6. Project timeline:
 - a) 1 page letter of intent due March 8 : outlining project format, sketch of content, development plan.
 - b) March 25-26 : project checkup showing work toward accomplishment of goal (1 hour in each subject area)
 - c) March 29- April 1 : 1 hour from each subject area to present to peers for feedback in a 5 min presentation.



Making The Connections

THE { SCIENTIFIC
LITERARY
SOCIAL SCIENCES
MATHEMATICAL
(ONE OR MORE) } VIEW OF { LIGHT
POWER
CHANGE { AND
THEIR
SUB
TOPICS } }

{ IS ANALOGOUS TO
IS SIMILAR TO
IS COMPARABLE TO
REMINDS ME OF } THE { SCIENTIFIC
LITERARY
SOCIAL SCIENCES
MATHEMATICAL
(ONE OR MORE) } VIEW

BECAUSE:

Suggested student projects - Grade Eight - LIGHT

1. Compile a series of paintings or sketches or 3D work of an object, a scene, an image or "something" in different artistic manners. A commentary on the function of light in each piece must be included. .
2. Compile a collection of "light and dark in music" on audio tape and write accompanying narrative for it.
3. Write a short story or a collection of poems that makes extensive use of light/dark imagery and symbolism. A written critical analysis must accompany the work(s).
4. Write an illustrated small book on the multi-disciplinary understanding of light. The interdisciplinary nature of the work must be clearly presented.
5. Complete an art portfolio of original work done by you explaining uses of light, colour and shadow. A written explanation of styles techniques and substance must accompany each work of art.
6. Complete an interdisciplinary study of the light bulb. A written critical analysis must be included.
7. Present a non-western or comparative view of light. Include an analysis.
8. Present, in some systematic way, an aspect(s) of light not presented in class.
9. Create a newspaper "Light News" including some of the following sections: politics, science, fashion, drama, lifestyles, classified, comics, vital statistics, business, literary review, entertainment, movies, editorial....
10. Script a Meeting of the Minds or Interviews with Da Vinci, Vermeer, Newton, Edison and an informed moderator about light. Video or Audio tape the meeting/interviews.
11. Choreograph a dance narrative or lyric about light. A written explanation must accompany the piece.
12. Own design subject to pre-approval.

Suggested student projects grade nine - Power

1. Discuss what might be a twentieth century resolution of the duality of power (a) power over nature (b) harmony with nature.
2. Assemble and present an explanation of a working model of a piece of power harnessing or power exploiting technology.
3. Make a newspaper or magazine devoted to the balance between power over and harmony with nature. Include some of the following sections: politics, science, fashion, drama, lifestyles, classified, comics, vital statistics, business, literary review, entertainment, movies, editorial...
4. Compare music that treats the theme of power. Prepare an audio tape and write an accompanying narrative.
5. Write a short story or comic book or collection of poems on the theme power. The interdisciplinary nature of your work must be clearly shown.
6. Do a photographic essay of power. Write an analytic narrative to accompany it.
7. Write an illustrated small book on the interdisciplinary study of power.
8. Complete an interdisciplinary study of the automobile.
9. Script a Meeting of the Minds or series of Interviews between Newton, Marx, Wordsworth and David Suzuki on the topic of power. Make a video or audio tape of it.
10. Present a non western view of power. Make a video of it. Clearly show the interdisciplinary aspect of the investigation.
11. Construct a "science fair" type of presentation on power. Clearly show the interdisciplinary aspect of the investigation.
12. Visit a famous event in history concerned with power. Video it. Clearly show the interdisciplinary aspect of the investigation.
13. Prepare a slides, music and audio presentation of power. Clearly show the interdisciplinary aspect of the investigation.
14. Own design subject to pre-approval.

Suggested Student Projects : Grade ten - Change

1. Script a video of changes on your life. Video it. Clearly show interdisciplinary nature of the work.
2. Script a video of changes in society in the 1990's. Video it with implications for the future.
3. Make a video of types of changes. Clearly show the interdisciplinary aspect of the investigation.
4. Present a non western view of change. Clearly show the interdisciplinary aspect of the investigation.
5. Script and/or video a "Meeting of the Minds" between Newton, Darwin, Einstein, Keynes, Toynbee, on the topic of change.
6. Write a short story or collection of poems on change. Clearly show the interdisciplinary aspect of the investigation.
7. Script and/or video a cross country survey of "Changing faces of Canada" in a T.V. investigative journalism format.
8. Visit a famous event in history concerned with change. Script and/or video it. Clearly show the interdisciplinary aspect of the investigation.
9. Discuss in some format, changes in
 - a) music in the 20th century
 - b) sexual attitudes and ~~behaviours~~ in the 20th century
 - c) economics in the 20th century
 - d) religion in the 20th century
 - e) science in the 20th century
 - f) personal freedoms in the 20th century
 - g) other
10. Create a Newspaper of "Change" Include some of the following sections: politics, science, fashion, drama, lifestyles, classified, comics, vital statistics, business, literary review, entertainment, movies, editorial...
11. Own design subject to pre-approval.