REVOLUTION OR HERESY: STUDENT PERSPECTIVES OF THE COPERNICAN MODEL TIMETABLE AT JOHNSTON HEIGHTS SECONDARY

by

Rick Breen

B.A., University of British Columbia, 1984

Harold Krische

B.Ed., University of British Columbia, 1980

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APPROVAL

NAME Richard Douglas Breen

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EXAMINING COMMITTEE:

A. J. (Sandy) Dawson, Associate Professor
Senior Supervisor

Barbara Holmes, Research & Development
Surrey School District Sch. Dis. #36
Member

Norman Robinson, Retired
Faculty of Education
Simon Fraser University
External Examiner

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Author:

(signature)

Rick Breen

(name)

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Author: _____
(signature)

Harold Krische
(name)

December 14, 1994
(date)

ABSTRACT

This is a quasi-experimental study which endeavors to assess student perspectives associated with a Copernican Model timetable at Johnston Heights (JH) Secondary School in Surrey, British Columbia. Research in Copernican Model scheduling is limited, therefore, the literature review also includes: a brief historical overview of scheduling developments; a focus upon scheduling directions in British Columbia; and an examination of conceptual notions associated with the organization of time for modern education.

Methodology includes three phases of data collection. The first phase involves a 57 question Likert response survey that was distributed to a representative sample of students at three high schools. Two of these schools operated with modified linear timetables. JH, the third school with students participating in the survey, implemented a Copernican Model timetable in the 1992-93 school year. The second phase consisted of twelve semi-structured interviews with students from JH. Phase three of data collection included an analysis of JH school based data related to student achievement. The data analysis also consisted of three phases: comparative statistical analysis of the survey data (ANOVA, Waller-Duncan); comparative analysis of school based data (achievement, attendance); and transcription and coding of the qualitative data (interviews).

The findings suggest that achievement and attendance improve, student decision making is empowered, and students generally 'feel good' about their schooling. Students also contend that the timetable makes it much easier to stay organized and that the macroclass format enhances their comfort level. Survey results demonstrated that JH students experience a broader range of instructional strategies than those encountered by students at the other two

schools. More importantly, no significant evidence supported retention and pace/pressure concerns. These results are generally consistent with other research on Copernican Model timetables. The study concludes with numerous suggestions for further investigation and research.

For the learners of yesterday,
today
and tomorrow.

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We are grateful to those people who have made this project possible. Administrators, teachers, students and others were extraordinarily cooperative in giving us many hours of their time. To this, we are indebted.

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CHAPTER 1: CONTEXT OF STUDY

Elaboration of the Title

Carroll (1989) frequently uses the term 'revolutionary' in describing the ideas behind his conception of a Copernican timetable. He implies that his timetable notions are akin to those of Nicholas Copernicus (1473-1543), the Polish astronomer, whose ideas on the universe revolutionized conventional philosophical and religious orthodoxy of the day. Like Copernicus, Carroll is finding his claims are being questioned. What underlies such questioning? One simple answer is tradition, an established foundation that is difficult to move. A proponent of new paradigms often exposes oneself to considerable criticism. Such ventures could even be associated with heresy, thus providing a logical extension of the Copernican analogy.

Carroll's schedule certainly questions the Carnegie Unit, the turn of the century time increment that dominates current timetabling in American secondary schools. His ideas on time allocation are markedly different from the conventional norm. Is Carroll the first to formally propose that schools are in a desperate state and near collapse? Is he the first to suggest a new and different organizational structure? The answer is definitely no. Melville, in his opening remarks at a recent timetabling forum at Simon Fraser University (1994), suggested that educational literature questioning timetable effectiveness and predicting the imminent collapse of an entire educational system is abundant and goes back to the beginnings of his teaching and administrative career, a span of some 35 years. Furthermore, he cited several timetable adaptations that were introduced as the solution to all of education's ailments and which quickly and/or quietly faded away never to be heard from again. Therefore, readers should be wary of dramatic words or dire predictions

from educational 'gurus.' Instead, readers and thinkers should ponder the facts and realize that education, like all large institutions, changes slowly. Despite all the negative rhetoric, restructuring efforts are continually being examined and implemented to keep the system evolving and improving.

Statement of Problem

Timetable adaptations are increasingly being looked to as a means by which schools can better meet their mandates in an increasingly complex world. Over the past four years, the Copernican quarter system timetable in particular has received tremendous interest. Currently, over twenty British Columbia secondary schools feature some form of a Copernican Model timetable. Proponents argue that this timetable better serves the needs of today's educational stakeholders. However, little research has been undertaken into the actual school effects this type of timetable engenders. This project seeks to contribute to filling a research void by examining student perceptions of the efficacy of one Copernican Model timetable. This study seeks to identify student attitudes, feelings, and performance levels associated with the Copernican Model timetable instituted at Johnston Heights Secondary in the Surrey School District, British Columbia.

Development of Project

The idea for this research was conceived, formulated, and approved as a joint project for a variety of reasons. First, our vision of the projects' scope was extremely broad. We conducted and analyzed nearly 260 extensive student surveys, interviewed 12 students and 5 teachers, and sorted through copious amounts of school based data. Second, and more importantly, we shared many professional and philosophical beliefs, we are in close contact

because we work at the same school, and we are compatible writers and thinkers. These internal reasons prompted us to tackle this project together. In addition, there were also external factors that pushed our desire to do the joint research.

Our school is a medium sized (600 students) junior secondary school in Surrey, British Columbia which is about to experience some significant changes. Come January 1995, all things being equal, new construction will begin at the site to double the school's size and enable it to expand to full secondary status. The original district plan called for this transition process to begin in the 1995/96 school year. These changes necessitated re-examination of all aspects of the school's organization and philosophy. Although some of this internal re-examination was happening anyway with changes proposed in the Intermediate and Graduation Documents (1994a), the district timelines for our expansion certainly accelerated these procedures. Since both of us are interested in the transition process, in school scheduling models, and in alternate timetabling models, it was agreed that a joint project investigating Johnston Heights' Copernican timetable would be personally and professionally extremely beneficial.

In addition, we believe that collaboration and communication are keys to developing productive, positive solutions to the many problems facing education today. This point was continually emphasized throughout the readings and discussions leading up to our project. Thinking back, now that we are near the end, we've found the support, the subtle push each other created, the opportunity to relate and evaluate ideas, and the discussions about research design and data interpretation, have proven to be extremely valuable and rewarding. Its been invaluable having someone else to talk to, to commiserate with, and to set the whole procedure in context.

Context

The 1990s are a time of uncertainty and change for secondary schools in British Columbia. The demise of the Year 2000 initiatives and, in their place, the implementation of the Kindergarten to Grade Twelve Education Plan (1994c) is evidence of this state. Several realities underlie this trend.

The world for which schools prepare graduates is becoming steadily more complex and competitive. Grade point average is being increasingly used as the discriminating variable in deciding opportunities for careers and entrance to higher education. The family unit has changed. Two income families are now the norm, not the exception. Single parent families are common. The student adolescent experience has changed. More and more students choose, or are forced, to work part time as they attain their education. They experience ongoing stress associated with time management and future job or career uncertainty. Compounding these difficulties, student withdrawl or dropping out, continues to represent a serious educational and social problem for British Columbia schools. Nevertheless, school structures have made few accommodations to acknowledge these social changes. This reality is both a concern and a challenge to educators and the general public alike. Recently, in British Columbia, the government began a process to address the issue and provide direction for the future.

Originally incorporated together under the Sullivan Report and the Year 2000 Documents, the relevant Royal Commission findings for secondary schools are now published as the Intermediate and Graduation Program Documents as well as the Kindergarten to Grade Twelve Education Plan. The dialectic collaboration between stakeholder groups reflect the belief that widespread educational changes are necessary. To that end, significant

structural and procedural changes are mandated. One of the central themes of these documents is the need for schools to become more flexible, accommodating institutions for students. Part of achieving this goal requires revisiting the central organizing mechanism for schools, the timetable.

Scheduling

Traditionally, secondary schools in British Columbia have featured some variety of a linear or semester timetable. However, neither of these timetables is particularly flexible for meeting emerging student, teacher, and societal needs. Since increased flexibility is seen as a desired goal, and since the central timetable serves to organize the school, it comes as no surprise that alternative timetable models are being scrutinized as mechanisms for positive change. One such timetable currently prompting widespread discussion among educators is the Copernican Quarter System model. This timetable was first implemented at L. V. Rogers Secondary in Nelson, British Columbia in the fall of 1991, and by the fall of 1994 over twenty additional British Columbia secondary schools had examined and implemented some version of the Copernican Model. This trend may accelerate over the next two years as the new requirements of the late Intermediate and Graduation Documents come into effect. Part of that acceleration will come with the scheduling pressures associated with the changes accompanying the new graduation requirements.

Soon, student graduation requirements will revolve around a unitized credit system where successful candidates must accumulate 52 units of coursework to graduate. While this change is not radically different from traditions followed in the past, the new requirements make it more flexible for students. No longer will all courses be worth the same number of units. Instead, some courses may be worth only two, not four, units and students

may be granted partial credit for courses they do not complete. In addition, students have the right to challenge courses and will be able to take independent directed study programs as credit towards graduation. Students will also be required to take courses from a broader range of disciplines. Therefore schools will provide a wider range of course offerings for students. These changes, when combined with mandatory work experience and ongoing career and personal planning, will push more secondary schools to examine quarter system timetabling.

There are many logical reasons for this development. By allowing students to complete courses at a faster rate, Copernican Model timetables provide more opportunities for students to tailor their course selection to their interests and aptitudes. Their longer, more concentrated classes offer students and teachers the chance to develop a new more positive and professional relationship. By taking only two classes a day, but for longer time periods, the model also facilitates the scheduling of work experience and career and personal planning. In this regard, Copernican Model timetables seem to better satisfy one of the major concerns in education, public perception of school efficacy.

One of the major forces driving today's proposed educational 'reforms' is the perception/realization that schools must do a better job in graduating more students and better preparing those graduates for the world they are about to enter. This reality is reflected in the Province of British Columbia Ministry of Education's three principles of learning that form the backbone of the current reforms:

> (1) learning requires the active participation of the student,
> (2) people learn in a variety of ways and at different rates, and
> (3) learning is both an individual and a group process
> (Kindergarten to Grade 12 Program, 1994c. p. 1)

The school timetable plays an important role in shaping the nature and success of the student learning experience. Proponents of Copernican Model timetables (Lindsay, 1993, Baxter, 1993) believes that they represents the best compromise between Ministry guidelines and practical school scheduling reality.

One of the primary educational tasks involves nurturing a students' intellectual and personal development. To meet this goal, and to incorporate the three principles of learning, schools must become more flexible in the manner by which instruction is offered to students. Proponents of the Copernican Model timetables suggest that they are designed around this very goal, that of dejuvenalizing the school experience for students. Carroll, its developer and chief proponent, believes that the Copernican timetable offers students more opportunities. By extending class lengths (macroscheduling), increasing individualized instruction, providing seminars to deal with complex issues, offering differentiated diplomas and stressing mastery based credits over letter grades, he believes students will learn more and schools will develop a new more professional, learning centered ethos. His exact vision has yet to be tested in the Canadian school system. However, variations incorporating key elements of Carroll's ideas are running successfully right now. The general aim of this study is to review another school's experience with the Copernican timetable. However, the main focus of this review will be not on school effects, but on student perceptions of the Copernican timetable.

Two case studies in British Columbia have focused on the school effects of this type of timetable. However, few studies to date have keyed primarily on students. This study sets out to do just that, to examine student perceptions of the Copernican Model timetable and to relate those findings in the broader

context of a general examination of Johnston Heights Secondary School. Originally, we hoped that this would be an all inclusive study of Johnston Heights Secondary. However, our inability to access some key grade point average data limited our ability to quantitatively analyze pre and post Copernican timetable changes in this area. Nevertheless, we can report impressions of achievement changes under this timetable. Data for these conclusions comes from provincial scholarship results and conversations with students, staff, and school administration.

The Schools: Johnston Heights, Schools A and B

Johnston Heights Secondary (JH) is a medium to large sized secondary school located near the Guildford Town Centre in the City of Surrey, British Columbia. It is surrounded by a wide mix of single and multiple family dwellings and lies in very close proximity to a major shopping centre. Its catchment area draws from a wide variety of ethnic backgrounds and the school prides itself on its cultural diversity. Three years ago the school and its community experienced some major changes.

Prior to 1992, JH was a moderately sized, but older Junior Secondary (grades 8 to 10). In 1988, pressures associated with rapid population growth, coupled with an outdated and somewhat unsafe physical plant, enabled the district to secure capital funding for a new full secondary school. With the imminent evolution to full secondary status, a new physical plant, and an ability to have its first graduating class, came the visionary challenge of meeting educational needs of the 1990s. A decision was made to implement a Copernican Model timetable. This certainly was not a half-hearted decision. All stakeholder groups were involved in the transition planning process and the ultimate decision to adopt the timetable. Staff chose to stay, or were hired, with

realization of the timetable's unique attributes. During the time of this study, JH had a teaching staff of approximately 100.

Since the school opened in 1991, it has experienced continual change. It has seen its enrollment swell to over 1800 students and its grounds to feature 13 portables. However, with the completion of another neighbouring secondary school during the summer of 1994, the school's population has dropped to just over 1400. This population is more in keeping with the design and planning of the school. It also creates a more suitable environment in which to foster the ethos that was anticipated with the new timetable.

The other two schools discussed in our study, schools A and B, are also secondary schools (grades 8 to 12) sharing features similar to those found at JH. Each is roughly the same size and has experienced similar population pressures over the last three years. During the course of this study, school A had a teaching staff of approximately 82 compared to school B with 86. One of the two is an older facility and is on line for an extensive renovation and expansion program. The other, by comparison, is a relatively new building. Both schools consist of numerous portables (9 and 20 respectively). Each of the schools is comprised of a culturally diverse mix of students with school A having a slightly larger ESL component. All three schools share a similar socio-economic status within their catchment areas. Schools A and B each operate a modified form of the traditional five by eight linear timetable.

Description of Method

We sought to combine quantitative and qualitative research techniques to develop a portrait of the effects the Copernican timetable had on students at JH. We began by reviewing the literature on how schools use timetables to

structure time, organize the school, and deal with other general timetable issues. With some scheduling questions in mind, and with an awareness of previous Copernican research instruments, we drafted a multi-faceted survey instrument. We gathered our quantitative data by surveying students in grades 9 through 12 at JH (the focus school) and two other high schools (schools A and B). From analysis of our data, we identified several issues to which JH students expressed different perspectives than students from schools A and B. These variances in student perspectives became the basis for further probing through an interview process with JH students.

Twelve students were interviewed. Their feedback helped flesh out issues which became apparent from analysis of the quantitative data. In addition, five teachers were interviewed. As well as giving their own opinion on issues, we asked them to answer questions in terms of what they perceived students thought about issues. The data was then analyzed qualitatively. Key concepts were identified and tallied to gauge the frequency of response. In addition, a broad sample of quotes, representing a cross section of opinions, were pulled from each of the interview transcriptions.

We also analyzed school based data on JH. We wanted comparative data on school issues such as attendance, grade point average, scholarship exam results, and percentage of students receiving A and B letter grades. However, due to time and budget pressures at the district level, we were unable to get all the information requested. Nevertheless, we were able to get enough data such that we could supplement it with our own findings and comment on some important issues. Finally, our accumulated data was subjected to statistical analysis.

Several general issues were probed in our questionnaire and interviews. Significant variations were apparent in the response pattern between JH

students and those of the other two schools. These survey questions had been categorized according to several themes, each theme representing a particular issue. Such a grouped set of questions can be termed as a scale. Subsequently these scales to statistical analysis. The results of this analysis is contained in chapter four.

Definition of Key Terms

For the purpose of this paper, the following definitions are used:

Carnegie Unit: refers to a 45 minute block of time. This turn of the century time increment still forms the basis for timetable development in many United States secondary schools. The result is that many students learn through taking six or seven classes per day each consisting of 45 minutes of instructional time. Critics of such timetables suggest this promotes a disjointed, unfocused, juvenalized educational system.

Copernican Timetable: timetable put forward by Carroll (1989). He envisioned students taking just two courses ('macroclasses') at a time, on a semester or trimester basis, and then benefiting from increased opportunities for individualized instruction, dealing with complex issues, differentiated diplomas, mastery based credits rather than letter grades, and increased mastery of course objectives.

Copernican Model Timetable: one of many variations of Carroll's original timetable conception. Generally these include a limited number (usually two) of classes, each extending two or more hours ('macroclasses') with some time built in for tutorial and/or advisement. Each class runs about ten weeks, and

occupies one quarter of the teaching year. Therefore such timetables are often referred to as some variety of the 'quarter system.'

Deep Structure: general term for structures in schools coined by Tye (1987) who described deep structure in terms of values and assumptions that have grown and been shaped by wisdom, traditions, and vested interests and maintained by educational inertia. Real change, if it is to come, must come through changes in this deep structure.

Flex Modular Timetable: innovative timetable, featuring variable length classes, possible multiple lunch periods and flexible scheduling.

Horizontal Timetable: term also used to describe Copernican Model timetable, as opposed to linear timetable. Each course meets for about 12.5 hours per week.

Linear Schedule: general term for the traditional full year timetable offered in British Columbia. Often referred to as the five by eight (5 X 8) timetable. Each course meets for about three hours each week.

Quasi Experimental Study: a term referring to studies which embody aspects of the classic controlled experimental techniques, but do not, or are not able to, keep only a single factor variable. Therefore, this type of study does not lend itself to expressing exact causation, such as a classical scientific experiment might.

Restructuring: popular educational jargon term of early 1990's. Inclusive term referring to the conceptual redesign of the structures and philosophies underlying schools in the 1990's and the processes associated with altering them to more accurately reflect the changing needs of their stakeholders.

Schedule: meaning timetable (list of classes/times students attend over the year).

Semester Timetable: most common alternative to linear timetable in province of British Columbia. Here, year is divided into two terms. Students take four classes in term one, four in term two. Each class meets for about six hours per week. Sometime referred as the four by twenty (4 X 20) timetable because students take four courses at a time for approximately twenty weeks per course.

Unitized Schedule: name given to Spectrum Secondary School's (Victoria, British Columbia) Year 2000 timetable. In an effort to accommodate Ministry guidelines, each course is divided into units and can provide flexible course entry and exit points. The end result is that not all courses are of the same length or worth the same credit.

Discussion of Limitations

We attempted to examine a huge topic in looking at student perspectives of the Copernican model at JH. We based our conclusions on a limited sample of JH students. Our survey sample represented about 98 students, or 7% of the student body. We interviewed 12 students from the same population. This represents just less than 1% of the population. We interviewed 5 teachers from a staff of about 90. Therefore, endemic concerns about the validity and

reliability of our sample size and the conclusions we draw are present. In addition, we faced some other endemic problems associated with 'outsiders' researching an organization. Our situation can be thought of as both a benefit and a problem.

First, as outsiders, we had to rely on individuals within the school to carry out key tasks for us. Such tasks ranged from the soliciting of classes which would participate in our survey, to the scheduling of selected interviewees. We believe our school contacts at JH went out of their way to help us in our endeavors. Nevertheless, they are human, they face varying time and commitment pressures, and they get ill, from time to time, like everyone else. Such normal occurrences may have affected our survey data or our ability to complete our full interview agenda. In addition, we planned to analyze school based data stored at the District's Computing Services Department. However, in the final analysis, we were unable to get some of the data. Therefore, the generalizations we make about academic improvements are not all based on actual school data, but also on previously published material and on conversations with students, teachers, and administration.

As in any early analysis of a significant change, we must also be cognizant of the Hawthorne Effect. We are researching student perceptions of their education at JH. We are trying, through direct and indirect means, to attribute our findings to the schools' Copernican Model timetable. We must not forget the circumstances under which the timetable was initiated. The timetable came with the transition to the new school. This was quite a change, a transfer from an older, run-down, crowded physical plant to a large, bright, state-of-the-art school. We know that there is some truth in the old adage that a change is as good as a rest. Some of the successes we observe in our research are directly related to the timetable. However, some of them also are associated

with the re-energization of students and staff associated with the brand new building.

In education, as with any people oriented organization, it is extremely difficult to attribute findings directly to specific variables. This stems from the fact that education is a social science and thus presents difficulties for replication of controlled experiments. Therefore, while we attempt to link school measures and characteristics with the timetable, it is always possible that variables other than those we've discussed had a role in shaping the observation.

Like any dynamic organization, JH is constantly changing as it redefines itself. We provided a snapshot of the school as it is perceived by its clients in the spring of 1994. Subsequent studies may show differences. However, we feel confident that we've accurately assessed the school and its timetable as it stood at the time of our research.

Organization of Project

Chapter one has set out the rationale behind the study and the context within which it takes place. Chapter two provides a review of the literature including: a brief historical overview of scheduling directions; an examination of factors influencing scheduling directions in British Columbia; and, an overview of the original implementation of the Copernican Plan. The chapter concludes with a section discussing timetable attributes that affect student performance, relationships, attitudes, learning methods and work habits. Chapter three examines in detail the data collection process and methodologies used to analyze the Copernican quarter system timetable at JH. Quantitative and qualitative assessment techniques are described. Chapter four reports and analyzes the quantitative and qualitative research findings. A discussion of the parallels between the results of this study and other

investigations of Copernican Model timetables also unfolds. The chapter reveals student perceptions and understandings as reflected in the field notes, questionnaire, written responses, school based data and interviews. Chapter five delivers research conclusions and provides suggestions for further investigation.

CHAPTER TWO: LITERATURE REVIEW

This literature review identifies and examines the background information which is relevant to establishing a context of this study. The review is comprised of five sections. The first section provides a brief historical overview of some fundamental developments related to scheduling at the secondary school level. This is followed by a section entitled 'Scheduling Directions in British Columbia' which targets some of the more recent forces responsible for shaping scheduling directions within the province. Section three seeks to establish some levels of significance attributed to scheduling, the organization of time, and the modern school. Section four provides a summary and evaluation of the Copernican Plan as implemented at Masconomet Regional High School in Massachusetts and reviews the findings from several British Columbia high schools that have implemented a Copernican timetable. Issues related to this timetable model are also reviewed here. The chapter concludes with a brief summary statement.

Historical Overview

Education appears to be in a continual state of crisis! Such suppositions emanate from the literature on secondary education and certainly establish 'educational turmoil' as one of its prevalent themes (Wideen et. al., 1990). During the past century, educational critics have targeted a diverse range of areas including, but not limited to, public funding, degree of specialization, curriculum focus, length of school year and simple mediocrity. Discussions have broached philosophical, political, economic and social issues. The failure of secondary schools (Brown, 1984) and concerns for the entire public education system (Conant, 1959; Goodlad, 1984; and Sizer, 1984) have been

well documented. Fullan ascertains that pluralistic societies foster pressures for educational change and that these pressures build as the complexity of the society increases (Fullan, 1991, p.17). Such criticisms and assessments reflect the myriad of pressures being exerted upon the educational system.

Despite criticisms, challenges and pressures, many procedural and organizational structures associated with high schools have remained largely unchanged since the early stages of this century. The traditional scheduling orientations have been linked to the days of an agricultural economy (Heron, 1983; Ballinger, 1987). It should thus not be surprising to find the scheduling components of North American education systems portrayed as a relic bearing resemblance to that of the dinosaur (Mojkowski, 1991). Timetable variations for secondary schools have primarily been limited to the option of selecting either an annual system or semester system, each featuring a set number of equal length periods within the context of the instructional day (Jorgensen, 1993). A recent American research survey of over 1600 large high schools found that 96% of the schools utilized a traditional type of schedule (Kosanovic, 1994). This is not meant to imply that other innovative models for configuring time have not been postulated.

In the early 1900s, Parkhurst sought to apply some of the Montessori concepts at the secondary level and this gave rise to the Dalton Plan. The Dalton Plan created flexible 'periods' and encouraged a self-paced, student-centered approach with emphasis on lab work (Conley, 1993, pp. 220-21). The 1960s brought a proliferation of literature regarding timetable modifications and introduced, among others, the flexible-modular timetable format (Dempsey & Traverso, 1983). A flexible-modular timetable provided for variable class duration, two or more scheduled lunch periods and a reorientation of instructional strategies. Variable class lengths and 'mod' enrollment limits

could distinguish between a period that was allocated for lecture or seminar/discussion use. The Copernican Plan (Carroll, 1989) is a recent suggestion which, through reconfiguration of time, offers an innovative model that challenges many current teaching and learning practices. The Copernican Plan also serves to illuminate several dilemmas associated with the existing scheduling models.

Tye (1987) and English (1993) envision our current entrenched schedules as control devices which create the patterns of social discipline within a school. English goes on to indicate it would be inappropriate to merely alter the frequency of weekly meetings or the length of such meetings, but that one must reconceptualize the entire student/teacher relationship. Carroll (1990) also supports this notion in his discussion of the Copernican Plan and contends that arbitrary division of the day into four, five or even more completely unrelated activities is unheard of in other areas of our society. English succinctly summarizes the scheduling paradox when he states, "Unfortunately, traditional schedules are firmly grounded in cosmologies that have come under severe attack in modern times" (English, 1993, p. 26).

While the past few decades have yielded significant quantities of work on effective schools and, more recently on restructuring, the work has more often than not provided very superficial treatment of school scheduling. Goodlad (1984), in his monumental inquiry into the conduct of schooling, devotes only a few pages to the allocation of instructional time and in doing so places emphasis upon daily pressures facing teachers. Tye (1987) enhances and develops the concept of the 'deep structure' of schooling, but falls short of presenting a compassionate assessment of the values, assumptions and traditions rooted within school structure. Little consideration is afforded the role of the schedule as a component of this deep structure. Tye certainly does not

stand alone in this respect. The term 'deep structure' does convey a sophisticated level of complexity, a complexity that is frequently acknowledged in the school improvement literature as a "disclaimer of sorts" (Wideen, 1990, p. 35). Educational research that has explored the relationship between schedules, school improvement and student learning is sparse. Comparative analysis of schedules and student achievement is primarily limited to full year and semester timetables with very limited treatment of quarter system models (Brophy, 1978; Sharman, 1989; McAskill, 1994).

Scheduling Directions in British Columbia

Historically, criticisms afforded the quality of schooling in British Columbia have not been unlike those rendered in other educational settings throughout North America. Educational critiques and resultant educational research have brought some structural and organizational changes. At the high school level scheduling changes have been quite limited. One example of such a scheduling change is the flexible modular timetable implemented at Handsworth Secondary School during the late 1960s. The predominant scheduling format in the province had remained a five by eight linear full year system with the major variation being provided by a semester system approach (Baxter, 1993; Jorgensen, 1993).

Meanwhile, increasing social, economic and technological pressures have yielded escalating demands for educational reform from a diverse range of stakeholder groups. In 1987 the British Columbia government initiated The Royal Commission on Education, a comprehensive assessment of the status of education in the province. While the directives that were presented to The Royal Commission did not specifically target scheduling, many of these directives carried significant implications for timetable configurations. One such

area of assessment pertains to the relationships among governance and administrative systems and their role in facilitating learning (Royal Commission on Education: Summary of Report, 1988).

Subsequent Ministry of Education documents have continued to elaborate on a 'vision' of scheduling (1994; 1994a; 1994c). Two crucial points are established. Firstly, it is clear that the school is identified as the primary unit of change. Secondly, paramount importance is allocated towards deriving maximum flexibility for schools to design and implement organizational structures that are responsive to student and community needs. The Ministry of Education documents identify key attributes (see section three) of scheduling practices which would facilitate implementation of the Intermediate and Graduation Programs. The document entitled Understanding the Graduation Program contains a section on 'School Scheduling' which endorses the need for creative and flexible scheduling practices and provides samples of six alternate schedules currently functioning in British Columbia Schools. Two of these 'alternate' schedules involve quarter system or Copernican-type models. Throughout these Ministry documents emphasis is continually placed on striving to better serve the needs of students. Possible considerations that are cited include year round schooling, extended or abbreviated school days, varying amounts of time for learning (enabling individual pacing), incorporation of a challenge process, and community activity credits (Ministry of Education, 1994a, p.92-94).

Whether it be in response to Ministry of Education directives, societal pressures and expectations, or the initiatives of professional educators, there has recently been considerable focus upon scheduling changes in the secondary schools of British Columbia. In September of 1993 the British Columbia Principals' and Vice-Principals' Association distributed a survey to

350 secondary schools in the province. Of the 108 survey respondents, 68% indicated that they had recently undertaken a timetable or other organizational change (B.C.P.V.P.A., 1994, p. 4). A majority of the respondents reported abandoning the traditional five by eight linear timetable and moving to a semester, trimester or quarter system. An analysis of the rationale provided by survey respondents for the organizational changes they reported acknowledged that:

> The major impetus for change appeared to be motivated by the desire to build more choice and flexibility into the school structure, enabling students and teachers to adapt to changing curricula. Most changes were made in an attempt to provide variable time allotments for different subjects, including individual tutorial time, and to reduce the number of pupil-teacher contacts in one day.....In every instance it was evident that an attempt was being made to provide flexibility for staff and students as well as providing more choice in programming to meet individual student needs. (BCPVPA, 1994, p. 4)

Although a significant percentage of administrators responding to the survey have indicated recent timetable/organizational changes, there is no evidence of a readily apparent or overwhelming trend with respect to timetable changes.

The Schedule and Schooling

Much of the literature associated with scheduling practices places considerable emphasis on the need to direct greater attention to the structuring of the school day. In association with this challenge, time is being recognized as a fundamental educational resource and focus on its use is being hailed as a significant objective (Anderson, 1993; Oakes, 1985). Discussions pertaining to the structure and allocation of time in the school system seem to have two distinctive foci: how time is configured to facilitate student learning; and how

time can be utilized to provide educators with opportunities to rethink and redesign schools (Conley, 1993).

The authors of Timepiece (1993) identify time as our scarcest educational resource and stress that while we can figuratively speak of saving, wasting, or spending time, no one has been able to retrieve, accumulate, suspend, accelerate, or delay time. Keefe (1993) in the forward to Timepiece (p. v) states: "Making time productive is one of the implicit goals of all attempts at school improvement and restructuring.... It is the most valuable thing we can spend." Time allocation decisions have been described as being amongst the most significant decisions that a school will make (Oakes, 1985; Ministry of Education, Province of B.C., 1994a).

Although time is certainly not the only variable impacting the structure of a school, it is perhaps one of the most identifiable and controllable variables. Recent survey results from a group of high school administrators revealed that "respondents felt the master schedule represents the school's best effort at bringing teachers, physical facilities, students, time, culture and materials together for the greatest possible effectiveness in providing an educational program" (B.C.P.V.P.A., 1994, p. 5). Dempsey and Traverso (1983) believe that the school schedule makes apparent and obvious the educational philosophy of the institution. They also feel that a school's master schedule is one of the primary means for developing a productive and positive ethos in schools.

A careful analysis of recent scheduling directions reveals some changes with respect to the traditional conceptions of school time as well as the philosophical directions of educational institutions. The draft document entitled Understanding the Graduation Program (Ministry of Education, 1994a, p. 92) suggests that scheduling practices "provide the basis for flexible, multi-purpose schools, by using new technologies that allow the school to adjust to the needs

of each student and provide a personalized learning environment." A similar philosophy is extolled via the Copernican Plan (Carroll, 1989) and the 'unitized' timetable developed at Spectrum Community School in Victoria, B.C. (Clemens, 1992).

Nonetheless, it would appear that the most significant conceptual revolution related to scheduling and time is still in its infancy stages. Mere alterations to the duration and frequency of time allocated during the course of a week are not sufficient to qualify as meaningful school-based restructuring. Such changes should only be construed as cosmetic ones (English, 1993). Increasingly, changes in the deployment of time are being envisioned as conceptual changes of the student/teacher relationship and a reflection of a change in educational beliefs (Jorgensen, 1993; English, 1993). The recent B.C. Ministry of Education 'Graduation' draft document (1994a) targets some specific values that will certainly challenge timetable considerations:

> Ideally, school organization and scheduling should enable the student to achieve higher standards of intellectual development while the school contributes more significantly to the student's human, social, and career development. Scheduling practices that acknowledge each student's uniqueness best reflect the principles of the Graduation Program. (p. 92)

At the core of the learner-centered school is a fundamental transfer of the responsibility for learning from the school to the student "providing each with significantly different roles and relationships than in traditional, curriculum-focused systems" (Ministry of Education, 1994a, p. 93). With such philosophical directives, each student will be required to envision the teacher not merely as an instructor, but as a facilitator, guide, coordinator, coach, advisor, and mentor. Also suggested was the fact that teachers, parents/guardians and students will

have to assume a role that involves a greater emphasis on a student's personal planning (Ministry of Education, 1994a, p. 93-94).

A subsequent B.C. Ministry of Education draft document entitled Organizing and Scheduling Schools (1994, September) seeks to alleviate potential concerns regarding the spectrum of philosophical shifts associated with timetables by acknowledging two viable choices for organizing and scheduling schools: adaptive scheduling practices; and restructured scheduling practices (pp. 10-11). Adaptive scheduling practices involve some modifications to the existing traditional schedules such that common instructional resources, relatively fixed amounts of course time, and a curriculum focus are retained. Restructured scheduling practices address conceptual changes to the student/teacher relationship and the allocation of structured time. These practices cater to individual student needs and their learning styles. Copernican Model timetable configurations illustrate such restructured scheduling practices.

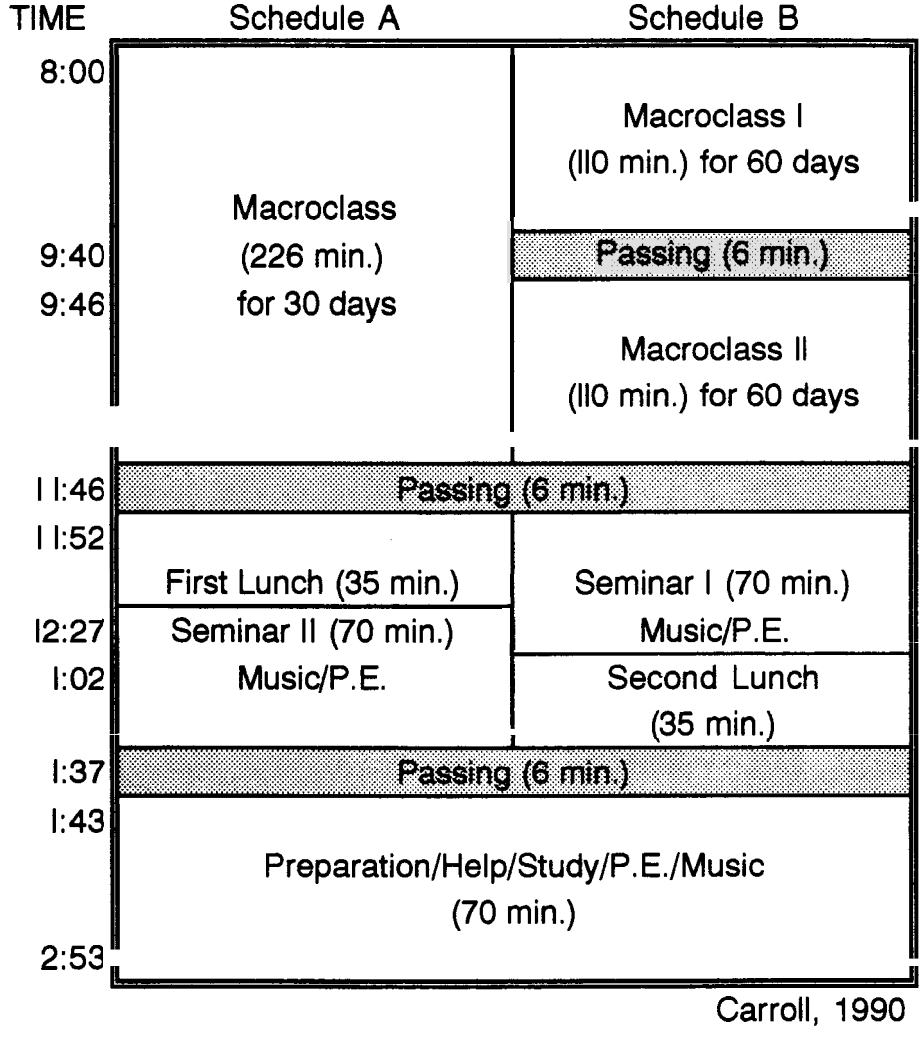
Copernican Timetables

The Copernican Plan, as originally proposed by Carroll, is a complete educational model that focuses upon restructuring many of the basic operational systems within a high school (Carroll, 1989). The 'revolutionary' aspect, the fundamental change of this proposal, is clearly the change in schedule (see Figure 1 for a sample schedule configuration). Carroll advocates the importance of a "macroclass" whereby students engage only one or two subjects at a time within an extended learning environment. It is assumed that such conditions will stimulate more effective and efficient instruction while reshaping the relationship between student and teacher. According to Carroll such a change is necessary to avoid "placing teenagers in a state of perpetual

motion and interrupted attention" (Carroll, 1990, p. 364). Further important aspects of the Copernican Plan are summarized when Carroll states:

> An integral feature of the Copernican schedule is a seminar program in which students grapple with the complex issues of today's world and pursue their special interests. Other features....include a mastery-based credit system (which substitutes for traditional grades), differentiated diplomas, individualized learning plans, and the "dejuvenilization" of the high school (Carroll, 1990, p. 358-59).

FIGURE 1: TWO SCHEDULES PROPOSED BY CARROLL



Carroll, 1990

Carroll goes on to explain that the Copernican Plan could afford high schools a significant reduction in class sizes, a notable increase in course or section offerings, a 60% to 80% reduction in the number of students that teachers interact with on a daily basis, and the ability for students to master 25% to 30% more information. It is further argued, that this could be accomplished under current funding constraints. Carroll is quick to note that this "Copernican Plan did not spring from an excess of zeal for restructuring.....it has evolved.....over three decades of my experience in American school systems" (Carroll, 1990, p. 358).

In 1989 a Copernican pilot program was instituted at Masconomet High School in Topsfield, Massachusetts. This pilot was known as the Renaissance Program and functioned as a school within a school. Eighty grade 9 students elected to participate in the pilot program and became known as "Renpro" students. The term "Tradpro" was coined to refer to the 95 grade 9 students who elected to remain with the traditional program. Implementation of the Renaissance Program began as a controlled study and was being evaluated by a team from Harvard University (Perrone et. al., 1992).

Structurally, in the first year, Renpro students were provided with two daily 100 minute classes and an afternoon seminar or traditionally scheduled electives, all within a trimester schedule. The Tradpro students faced seven daily 46 minute classes and worked on a linear schedule. Renpro students thus received 28% less curricular focused instructional time. An extensive assessment and study followed. It included classroom observations (with video analysis), interviews, surveys (parent, teacher, student), and standardized testing. Perrone et. al., (1992) reported that several important distinctions emerged between Tradpro and Renpro students. In contrast to Tradpro students, Renpro felt their teachers knew them better, cared more about them,

individualized their course work more, and talked to them more. They themselves were much more comfortable speaking out in class, were more apt to discuss issues and did more seatwork. Renpro students also expressed greater satisfaction with the amount of material they covered, found their subjects more interesting, and knew their classmates better. They acknowledged a greater understanding of course material and the relevance that their studies had to the day-to-day realities of their lives.

However, Renpro students did state concerns regarding intensified pressure to perform, retention of information (particularly as related to languages), and felt that they were under the spotlight much more than they would have preferred. Renpro students also expressed reservations about the seminar program and questioned the focus and organization of that aspect of the program. Classroom observations and teacher comments supported student opinions. Shifts in pedagogical styles of instruction were promoted by the smaller classes and the longer periods. Renpro teachers engaged classes in more groupwork, cooperative learning and individualized instruction (Perrone et. al., 1992, p.19, pp. 36-37). Renpro teachers often cited an excellent rapport with their students and recognized increased student ownership of the learning process. In fact, teachers themselves stated that they felt rejuvenated and were excited about their teaching (Perrone, 1992, p. 47). Finally, as determined by an extensive videotape analysis, Renpro students displayed significantly higher critical thinking and collaborative skills than did Tradpro students.

An analysis of student performance data revealed that retention tests show no significant differences between students in either program within the first 15 months after course completion. These comparison tests, referred to as 'Gap' tests, were administered from three months to fifteen months after a

course was completed (Perrone et. al., 1992, p. 38). Assessment of academic performance of the Renpro and Tradpro students were essentially equivalent in most areas: "the first year's data showed that there was no subject in which students of one program consistently performed better than students of the other" (Perrone, 1992, p. 28). Such results would appear to be favorable for the Renaissance Program, especially if one considers the disparity of time allocated to the courses (Tradpro Chemistry Honors students had 162 class hours, other courses were comprised of 137 class hours vs. Renpro students with only 118 class hours).

The Renaissance Program at Masconomet High School was curtailed after the second year, largely due to economic, political and implementation issues. The Copernican Model has since been adopted in a variety of configurations and in many different locations. With subsequent positive evaluations in hand, Carroll now asserts that "continuing to rely on the traditional Carnegie structure raises the question of professional malpractice" (Carroll, 1994, p. 105). In his recent article entitled The Copernican Plan Evaluated, Carroll briefly illuminates the successes of seven other high schools who have implemented a Copernican type of schedule. Carroll does raise the key question regarding the variety of Copernican schedules that seem to be emerging and the differing impacts that they may have on student performance. In response to the question, he introduces the notion of the Copernican factor: "the sum of the number of classes that a typical teacher teaches and the number of classes in which a typical student is enrolled each day" (Carroll, 1994, p. 110). For example, if a teacher is instructing three classes during a term and a student is registered in four classes in that term, then the Copernican factor for that school would be seven. According to Carroll, a school with a lower Copernican factor is likely to have a greater impact on student performance.

Evaluations of the seven Copernican schools pointed toward improved student conduct while dropout rates declined and academic performance escalated. The degree of school improvement in these areas did relate to their Copernican factor.

Similar results are being reported by the British Columbia secondary schools that have adopted a Copernican model timetable. Most of these schools are employing a quarter system with students concentrating on two classes for a duration of approximately ten weeks. L. V. Rogers Secondary in Nelson was the first B.C. school to adopt the Copernican Model in 1991. At least five other schools followed this direction in 1992 (Baxter, Lindsay, Turner, Jorgensen, 1993). A brief analysis of the Copernican timetable strengths and limitations as reported by staff and students of five British Columbia high schools is presented in a summary format in Table 1.

Two studies in particular have provided some useful data on the Copernican timetables as they have been implemented in British Columbia. Veregin and Hierck (1993) completed an analysis of the "Horizontal Timetable" implementation at L. V. Rogers which indicated that the timetable was a highly effective structure for a senior secondary school. The numbers of students achieving honor roll status increased by 50% and the projected graduation rate rose from 73% to 90% (Veregin, 1994). Staff concerns centered upon the uneven distribution of preparation time during the course of the year and the intensity of the quarter system. Jorgensen (1993) in her analysis of the Copernican initiative at New Westminster Secondary, found some similar results. Jorgensen (1993) also notes that while attendance and achievement rates had improved, one of the most exciting changes had been the change in attitude in some of the students. They appeared to be more aware of the

TABLE 1: ANALYSIS OF COPERNICAN MODEL TIMETABLES AT FIVE B.C. HIGH SCHOOLS

School Implementation Years	L. V. Rodgers 1991-92	Rutland 1992-93	New Westminster 1992-93	Johnston Heights 1992-93	Howe Sound 1992-93
STRENGTHS: Students	• only 2 final exams at a time • only 2 courses at a time • 90 minute lunch with 1/2 hr. tutorial	• able to learn more effectively • only 2 classes at a time • successfully completing more work • provides more extra help time from teachers	• receive more feedback and attention from teachers • better able to complete assignments • allows for a more positive attitude toward school	• can focus on only 2 courses at a time • only 2 final exams at any one time • rate of course completion	• ability to focus and be organized • rate of course completion • personalized teaching that takes place under the system
Staff	• better success rate of students • flexibility allowed, effective use of time • responsibility of fewer students at one time	• enhancement of teaching experience • more quality instructional time • students are more successful	• allows for better teacher-student relationships • promotes improved teaching methodologies • students more successful • drop-out rates reduced	• opportunities for enhancing teaching methodologies • flexibility allows for effective use of instructional time	• better student success rates • attendance rates have improved • enhanced teaching techniques
LIMITATIONS: Students	• too much material presented too quickly • difficulty of recovering from absences • in-class breaks too short	• pace and pressure • appropriateness of timetable for band?	• time pressure • impact of absences	• pace and pressure often too great • really important to have a balance between hard & easy courses • impact of time missed from school	• impact of absences • balancing of courses being taken
Staff	• uneven distribution of prep time • intensity of quarter system • retention system	• impact upon performing arts program • prep time distribution	• focus increasingly content driven • increased work load and stress • some courses such as band & math may not work well in quarter system • uneven distribution of prep time	• distribution of prep time • intensity level is high • some courses may not be suitable for quarter system • creating continuous levels of school spirit	• distribution of prep time • high intensity levels
SOURCE:	• Veregin (1994) • Hierck & Veregin (1993)	• Lindsay (1993)	• Jorgensen (1994) • Jorgensen (1993)	• Baxter (1993) • Breen & Krische (1994)	• Turner (1993)

importance of time and were developing the accompanying attitudes that the primary purpose of school is to learn in the classroom rather than visit friends at lockers during a break (Jorgensen, 1993). The largest degree of concern emanated from staff, especially those teaching senior academic courses. Their complaints centered around too much time pressure, extensive classroom attention span requirements, insufficient time to learn lessons well, the feeling that everything is stuffed into 10 weeks. While noting these concerns, Jorgensen concludes:

> ....if the primary advantage of the Copernican system is that teachers are able to get to know their students better and students are able to feel more comfortable being in school, and the primary disadvantage is that teachers feel they are not able to cover the content as well, then perhaps the problem with the quarterly timetable is not the issue of 'time', but the issue of deciding which content is really of educational value? (April/May 1993, p. 13)

Conclusion

Our preliminary literature search revealed little information pertaining to assessment of the Copernican type of scheduling model. Indeed, educational research that has explored the relationship between schedules, school improvement and student learning is very sparse. Comparative analysis of schedules and student achievement was found to be limited to full year and semester timetables. This of course is what one may expect given the iconoclastic imagery which has often been cast upon non-traditional timetable formats.

Subsequently, literature and reviews in the broader field of structural and organizational change were selected to understand the emergence of the Copernican timetable. Although the published literature predominantly reflects American research and opinion, we contend that the contextual situations

giving rise to the Copernican type schedule are somewhat homogeneous in nature. In British Columbia the recent proliferation of Copernican, as well as other non-traditional timetable models, has brought signs of vitality and vigor to scheduling research (Hierck & Veregin, 1993; Jorgensen, 1993; Clemens, 1992; B.C.P.V.P.A., 1994; Ministry of Education, Province of B.C., 1994a; McAskill, 1994).

Although investigations of the Copernican Model schedules reveal both limitations and strengths, it appears that the positive attributes may exceed the concerns. Researchers have repeatedly cited improved student attitudes, reduced dropout rates, development of a wider range of methodologies for instruction, increasing GPAs (grade point average), greater collaborative skills, and excellent student-teacher rapport. Concerns have centered around the intensity (pressure & pace) associated with the Copernican timetable and the resultant impacts. Teacher burn-out has been raised as an issue along with a concern over the uneven distribution of preparation time that accompanies some Copernican models. Students can also feel the significant impact of extended absences. At this time most of these results still represent a relatively small sample and, at best, only a few years' experience with such a timetable variation. Such research and documentation over longer periods of time will be a welcome addition to a body of literature still in its infancy. However, it would appear the assumption that the traditional daily and yearly schedules are the more effective has clearly been challenged.

CHAPTER THREE: METHODOLOGY

The purposes of this chapter are to: (a) establish the context of the quantitative and qualitative analysis undertaken in this study; (b) portray and assess the methods and procedures that were engaged; and (c) explicate the manner in which the data are analyzed in order to develop a student perspective on the impact of a Copernican Model timetable.

Context of the Research Methodology

Educators, whether they be classroom teachers or administrators, have come to relish a degree of autonomy associated with their roles. They are, often by necessity, compelled to make decisions and as such it may be assumed that they have the experience to make viable decisions. However, one must ask if experience itself, or experience in accordance with other sources of knowledge such as tradition or authority, provides a sufficient platform from which to make decisions? It is within this context that the usefulness of scientific inquiry emerges. Ary has suggested that "it is scientific knowledge about the educational process that makes the most valuable contribution to decision making in education" (1990, p. 4). In general, the scientific or quantitative approach follows a process whereby researchers "move inductively from their observations to hypotheses and then deductively from the hypotheses to the logical implications of the hypotheses" (Ary, 1990, p. 10). The analysis of the quantitative data is generally expected to provide confirmation or denial of the hypotheses.

Unfortunately, the application of a quantitative method does not necessarily assure that sufficient conditions have been set for valid conclusions. It is within the field of the social sciences, and especially in many

of the matters pertaining to education, that some limitations of quantitative inquiry become apparent. Tye (1987) is one of several educational researchers to identify the concept of the 'deep structure' of schools. This concept recognizes the potential complexities associated with understanding a specific school culture. School cultures are often derived from such a large number of independent and interactive variables, many of which are inconsistent from school to school, such that researchers must be very cautious when attributing results and prescribing generalizations. Replication of a particular situation in order to check the validity of a hypothesis could prove to be exceedingly difficult. One must also note that educational researchers are often required to rely upon subjective interpretation. Issues associated with how one best inspects the attitudes, values and feelings of a randomly selected group of students are likely to materialize. Subsequently one must ask which method of inquiry is likely to be the most appropriate and successful?

Merit might be associated with the use of quantitative and qualitative methods of inquiry within the same investigation. Upon completion of our literature review it became apparent that a combination of quantitative and qualitative assessment techniques might best meet the needs of this particular investigation. Qualitative analysis should not be viewed as an alternative investigative paradigm, but as a viable research methodology that has its own advantages and disadvantages. Qualitative research seeks to: "understand human and social behavior from the 'insiders' perspective, that is, as it is lived by participants in a particular social setting" (Ary, 1990, p. 445). Although this study does not represent conventional qualitative research, it has drawn upon approaches developed within the qualitative domain.

Data Collection Procedures and Methodology

This study is comprised of three phases of data collection. Phase one involved the administration of a quantitative survey instrument that sought to: identify parallels with previous studies of Copernican Model timetables; distinguish between student perspectives based on the type of scheduling model they are experiencing; and assist in developing the orientations that would become associated with the follow-up semi-structured interviews. The second phase of data collection consisted of a qualitative exploration of student perceptions of the Copernican Model timetable at Johnston Heights Secondary (JH). The concluding phase of data collection consisted of analysis of school based data in an effort to corroborate, or to question, findings associated with the other phases of data collection. Figure 2 provides a schematic representation of the three phases of data collection as they relate to the outcomes.

Phase One. The initial phase of the data collection consisted of the development and completion of a survey instrument. A comprehensive literature review highlighted fundamental issues and needs related to examination of student centered perceptions of a specific timetable. Previously administered student surveys (Perrone et. al., 1992; Jorgensen, 1993; Hierck & Veregin, 1993) were consulted and further facilitated the identification of potentially significant timetable attributes. Surveys oriented toward investigation of the Copernican Model timetable provided additional directions for the development of the survey instrument. Limited comparative data between linear/semester schools and Copernican Model schools established the need for a survey that would go beyond JH. Thus, two non-Copernican Model schools were identified to participate in the survey. Both of these schools

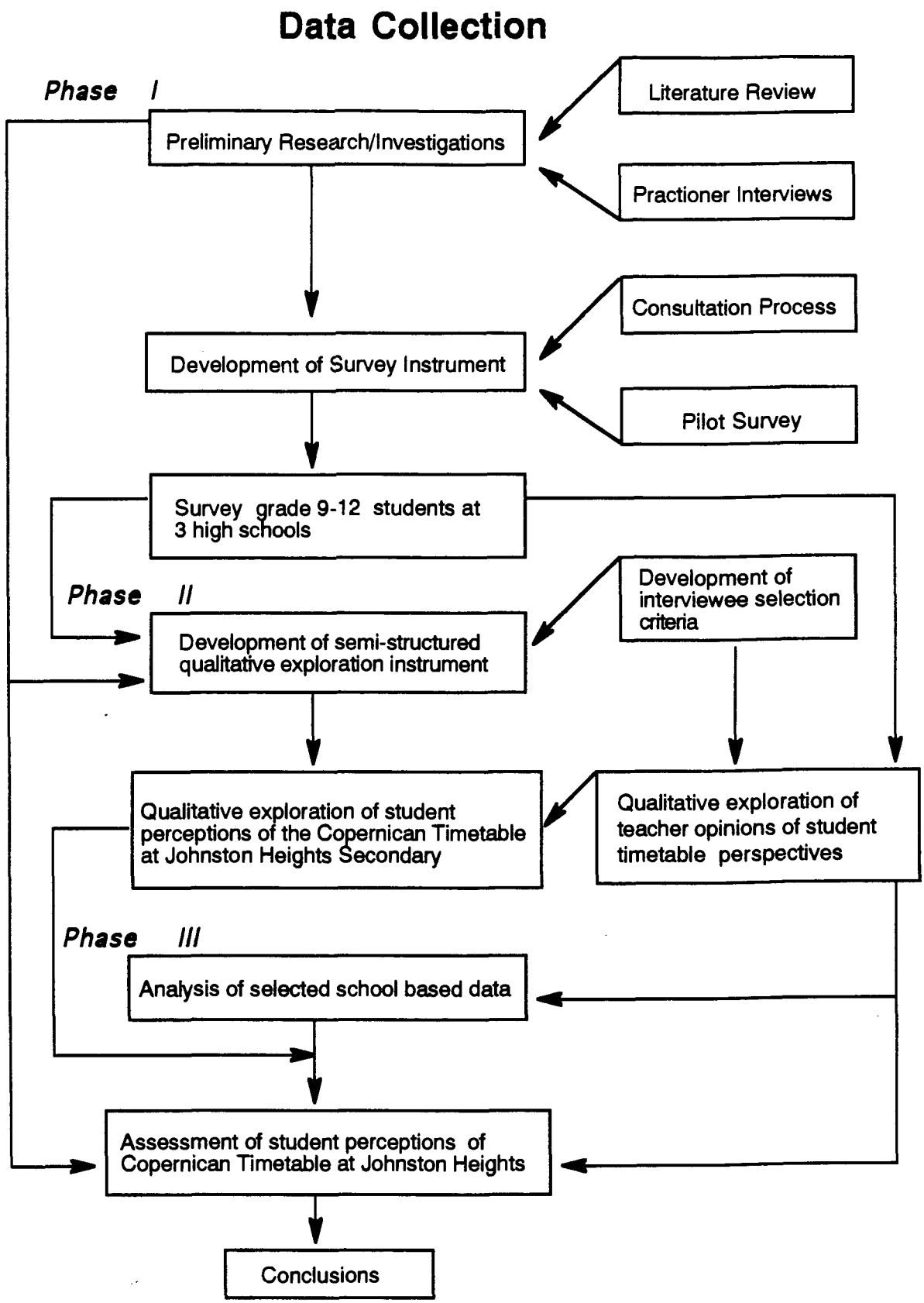


Figure 2: Conceptual Overview of the Three Phases of Data Collection

functioned under a modified linear timetable (see Appendix A-2, p.100). Ideally, comparison of student perspectives might also have included a semestered school. The two non-Copernican model schools were selected because of their demographic similarities to JH. All three school populations represent a similar array of socioeconomic backgrounds and a diverse ethnic mixture. Moreover, one of the non-Copernican Model schools has recently experienced a construction process and a shift to a new facility, as has JH. In general, the perceived differences between all three school populations are minimal.

A consultative process was established to shape the questionnaire itself. Suggestions and critiques were solicited from a variety of educational practitioners including personnel from the District Planning and Research Department, the senior supervisor associated with this project, administrators from JH, teachers, and of course students. Student collaboration began with: "Can you describe some of the really important questions that need to be asked if someone is looking at how a timetable effects students?" The ensuing dialogues and critiques coming from this group of practitioners certainly contributed to refinement of the survey instrument. The resultant survey included questions that could be grouped to reflect such themes as student satisfaction, instructional methodologies, student comfort level, achievement, pace/pressure, work habits, scheduling and retention. Each of these themes is represented by a cluster of questions on the survey. A draft format of the questionnaire was then administered to a group of five students from an independent high school as a pilot of the survey. This group was selected to represent a range of student abilities and diverse program interests. Pre and post survey briefings proved valuable, primarily with respect to student interpretation of some questions, and did result in further revision to the survey instrument.

The questionnaire consists of 57 questions and uses a five point Likert response scale. Values with a consistent range from minus two to plus two were assigned to the five point scale (strongly disagree = -2, disagree = -1, neutral = 0, agree = 1, strongly agree = 2). Fifteen additional questions, specific to the Copernican timetable, were included on the JH survey. Five of the questions permitted an extended response opportunity, while ten questions use the Likert response scale. (The questionnaire is included in Appendix B-1, p. 101). The questionnaire was administered in English classes at each of the three schools. These classes were chosen for three reasons. Firstly, they tend to be of uniform size (the collective labor agreement limits these classes to 25 students). Secondly, their ability grouping tends to be relatively heterogeneous in nature. Finally, these classes were, for the most part, gender balanced (47% male, 53% female). One English class in each of grades 9 through 12 completed the survey at each school. Grade 8 students were not included in the assessment as different transitional programs and timetable configurations were in place. At JH, grade 8 students are basically semestered (Baxter, 1993). Table 2 provides a detailed breakdown of the number of student survey participants by grade level at each of the three high schools.

Table 2: Number of Student Survey Participants

Grade	School: J.H.	"A"	"B"	Total
9	24	18	19	61
10	23	17	20	60
11	31	20	21	72
12	20	24	23	67
Total	98	79	83	260

Phase Two. The second phase of data collection included the development of a semi-structured interview procedure, the arrangement of the interviewee selection process, and the completion of the interviews with students of JH. The specific probing within the sessions were determined by a preliminary analysis of the quantitative survey results. Other areas identified for discussion were selected on the basis of previous research findings associated with Copernican Model timetables. Once again, a collaborative process led to the formulation of ten guideline questions for the interviews.

The identification of a relatively small number of students for the qualitative investigation precluded the use of a random selection process. A set of selection criteria was established to target a relatively heterogeneous group of students. When selecting potential interview candidates, emphasis was placed upon equal grade representation, gender balance, school program coverage and differing academic ability levels (see Appendix C-1, p.123). An administrator at JH facilitated the selection process via English classes. The English teachers were requested to nominate five students from each of the focus grades (9-12). Students being selected for participation in the interview process were not necessarily involved in completion of the quantitative survey. All of the nominated students attended a briefing session one week prior to the commencement of the interviews. From this group of students the researchers hoped to interview sixteen students, four from each of the selected grade levels. This process did not proceed smoothly. Liaison difficulties with the school based coordinator of the student selection process, and delayed submissions of student permission forms, extended the timelines that had been allocated for the interview process. Eventually, twelve students representing five program areas were interviewed. Selected students reflected all ability levels and were

evenly distributed amongst the four grades. The interviewers feel that this group represented the identified selection criteria.

The interviews were conducted in a very comfortable conference room and typically ranged from 25 to 45 minutes in length. The entire discussions were audio taped and subsequently transcribed. Both of the researchers participated in each interview session and completed a debriefing conference after each interview. Interviewees did have access to a copy of the guideline questions but primarily elected to respond to orally communicated prompts. It should be noted that deviations beyond the guideline questions were not uncommon.

In addition to the student interviews, several other corroborative data sources were examined. These examinations consisted of formal and informal methods of analysis. On several occasions during the eight visitations to JH, informal discussions were initiated with teachers and administrators. While the dialogue frequently centered on student perspectives of the timetable, a context for understanding the organizational culture of the school was being formulated. Meanwhile, a formal semi-structured interview, similar to that conducted for students, was organized for teachers. Five teachers were solicited on a voluntary basis via a staff meeting presentation and handout which provided background for the research project and set out the criteria for participant selection. The criteria included gender balance, junior and senior course experience, representation from several discipline areas, and teaching experience at the school prior to implementation of the Copernican timetable. Interviewee questions sought to corroborate findings from the questionnaire and the student interview process.

Phase Three. The final phase of data collection incorporated both qualitative and quantitative methods of analysis. Informal dialogue with teachers and administrators solicited information supplementary to that which had become evident during phase one and two of this study. Impressions were sought regarding such matters as student attendance and discipline referrals to the office. Statistical analysis centered on student achievement records including the number of honor roll recipients, the percentage of failing marks, the distribution of 'A' and 'B' letter grades, and the Grade 12 Provincial Exam results.

Data from all three phases of the collection procedure contributed to the identification of issues, the formulation of further hypotheses, and the subsequent confirmation, rejection, or further questioning of established premises. The integration of assessment methodologies and the progression of data collection procedures yielded a method of triangulation with respect to the interpretation of results.

Data Analysis

Prior to the manipulation and presentation of data several conventional methods of data analysis were reviewed. Advice was also sought from the District Planning and Research Department. Significantly distinctive traditions of analysis have emerged within each form of research methodology that were applied within this study. Despite the analysis variations associated with the qualitative and quantitative methodologies, selected procedures can best be described under the headings (a) data organization and (b) statistical procedures.

Data organization. Data organization began with the development of a set of premises and questions. Completion of the literature review and an informal consultation process (involving students) allowed for the identification of focus categories which included: student perceptions of the fundamental Copernican components; exploratory themes (instructional methodologies, student comfort level, pace/pressure, etc.); and associated or corroborative data (whether that be exam results or teacher opinions on student perspectives of the timetable). This procedure was supported with the establishment of three distinctive phases of the data collection process (described earlier in this chapter). Furthermore, considerable thought was directed at the development of appropriate tables, figures, graphs and appendices to assist with the organization, comparison and summation of data. Some of these representations had to be consfructed to acknowledge both the quantitative and qualitative data that had been collected. Although a framework for data organization had indeed been developed in advance, the experience of completing this study would suggest that the extent of advance planning for the organization and presentation of the data ensures that all information collected is directly relevant to the research questions. A significant body of data beyond the scope of this particular project has clearly been collected.

Statistical procedures. The selection of particular quantitative and qualitative research methodologies assisted in determining the type and appropriateness of statistical procedures used in this study. Let us begin with an analysis of the methodologies. The questionnaire itself extends beyond an effort to identify key variables; it endeavors to define the extent of covariance between JH and schools A and B. This type of survey is frequently referred to as an explanatory survey and attempts to convey behaviors and/or attitudes based on the

collected data (Ary, 1990). An explanatory survey can thus be considered a type of causal-comparative research. The actual processing of the data and subsequent statistical analysis was performed with the assistance of the District Planning and Research Department using the SAS computer software package.

The data analysis for this study consisted of three components: phase one of the quantitative analysis; phase two of the quantitative analysis; and the qualitative analysis (see Figure 3 for a schematic representation of the data analysis process). Phase one of the quantitative data analysis began with a review of the frequency of student responses for the Likert survey categories. Calculation of means and standard deviations (see Appendix B-3, p.113) facilitated the formation of some focus questions for the qualitative instrument. The method used for comparing the survey responses between the three participating schools is called 'analysis of variance' (ANOVA). This method seeks to establish whether there are any differences between the groups with a single probability associated with the test. The hypothesis presumes that all groups have the same mean. The differences between groups for all assessments have been evaluated at a 0.05 alpha level.

The Waller-Duncan comparison procedure for analysis of multiple variance was the post hoc test applied to the survey data. This particular technique for analysis of variance can be described as 'robust', meaning that the assumptions associated with the test can tolerate some degree of violation and still be accepted. Appropriateness of the Waller-Duncan was further enhanced by the fact that this procedure will tolerate cell sizes that are unequal (unbalanced designs). However, a key attribute of the Waller-Duncan provides variance analysis for grouped multi question means. Essentially, this technique facilitates the analysis of scales, whereby a scale is considered to consist of a

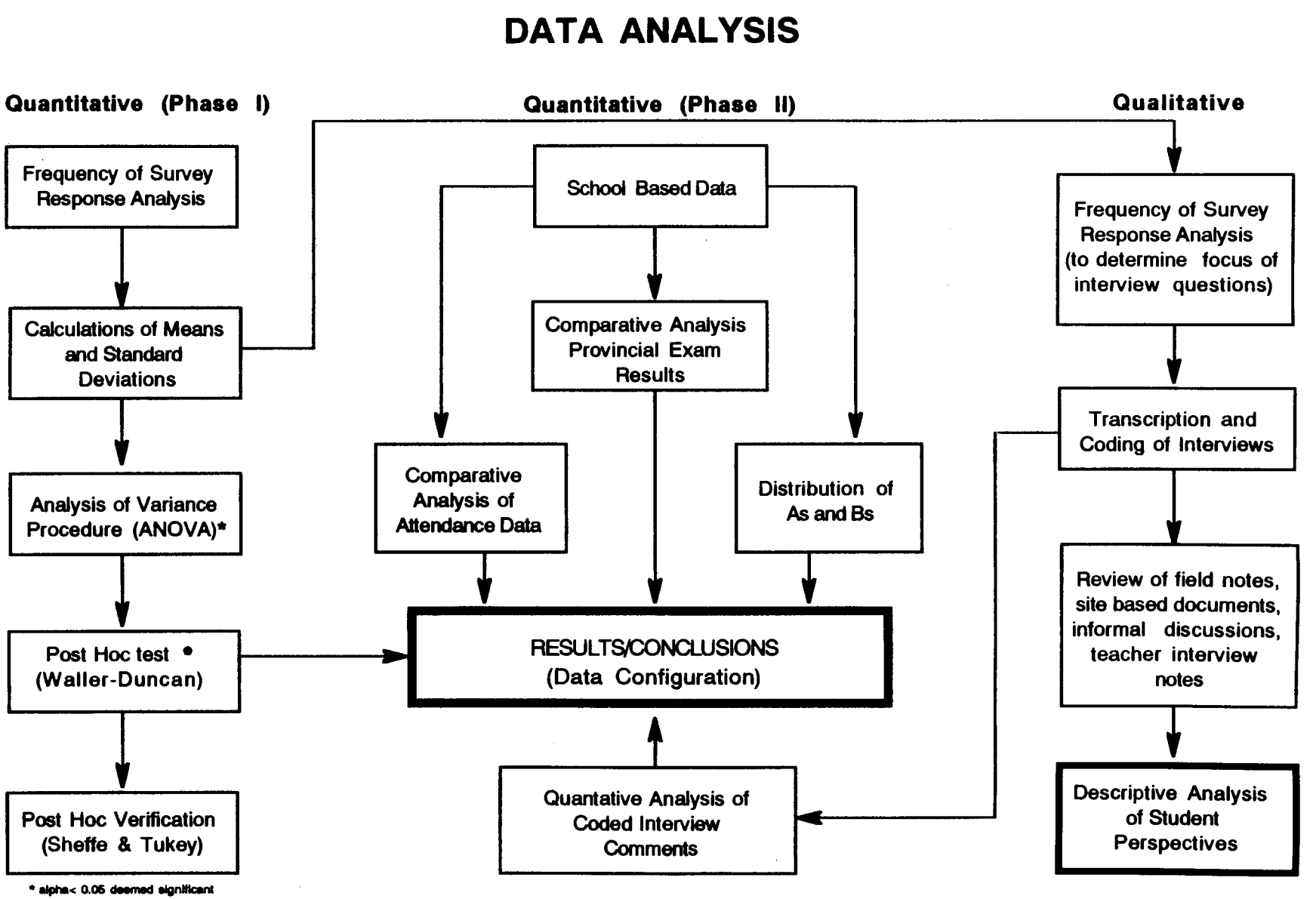


Figure 3: Conceptual Overview of the Data Analysis Process

cluster of survey questions representing strong thematic unity. For example, our study targeted 'instructional methodologies' as a potentially critical factor associated with the impact of a Copernican Model timetable. Thus, a number of survey questions (Q. #'s 7, 9, 11, 45, 46, 47, 48, and 53) solicited student impressions relating to methodological practices (see Appendix B-5, p. 116 for a complete listing of all scales that were employed). Student responses to this entire group of questions may now be analyzed and compared between the three schools represented in our initial survey. While one may still choose to analyze group variance for an individual survey question, greater credence can be associated with a hypothesis as the number of items within a scale are increased. Ideally, such a scale would be comprised of at least three or four questions. The Waller-Duncan test procedure was found to be somewhat unconventional and therefore results were verified with both Scheffe's multiple comparison procedure and Tukey's studentized range test. The findings, in all cases, were compatible.

Phase two of the quantitative data analysis process examined three types of school based data that were likely to reveal the impacts of a substantive timetable reconfiguration. The comparative examination of data included: Grade 12 Provincial Exam results; the distribution of letter grades for grade 10s; and historical attendance data. This phase concluded with a quantitative analysis of the coded interview comments that are associated with the qualitative methodology.

The third component of the data analysis process involved qualitative methodology. Initially, a frequency analysis of student survey responses assisted the development of the interview guideline questions. Primary focus was placed upon the student interviews. During each interview the investigators maintained field notes which ranged from descriptions of facial

expressions associated with a student response, to additional directions for probing that may be appropriate for subsequent interviewees, to the types of rationale students presented to explain their perspectives. Additional notes emerged from the debriefing session held after each interview was completed. These notes were consulted as the transcripts were reviewed and in some cases they were instrumental in providing strategies for coding the transcribed dialogue. Coding assisted the identification and categorization of response patterns (a compilation of sorted student responses has been included in Appendix C-3, p. 126). The processes of coding and categorization assisted investigators in reducing and reconstructing the data such that some theoretical frameworks could be developed and a descriptive analysis of student perspectives could be portrayed.

Statistics derived from all three components of the analysis process have been presented in a variety of formats to facilitate visual and comparative analysis. Figures, tables and graphic representations aid in the portrayal of results. Throughout the course of this study an effort has been made to, where possible, integrate quantitative and qualitative assessment techniques. The categorization and subsequent quantitative analysis of written and oral student responses contribute significantly to the development of meaningful understandings of student perspectives on the Copernican Model timetable (see Table 5, p. 60, and Appendix B-6, p. 117).

Validity of Assessment Methods

One must obviously give substantial consideration to the conceptual framework within which research is conducted. If a research design is to be successful, attention must be directed toward levels of internal and external validity. Internal validity involves the development of adequate controls

whereby the "...design of appropriate controls is a matter of finding ways to eliminate extraneous variables--that is, variables that could lead to alternative interpretations." (Ary, 1990, p. 311). The purpose of controls in an investigation is to create a situation in which the impact of variables can be assessed. Ary (1990) articulates and describes several extraneous variables that could threaten the internal validity of a research design.

Generally, one must give consideration to 'historical' threats where "...events or conditions, other than the experimental treatment, may occur between the first and second measurements of the subjects to produce changes in the dependent variable." (Ary, 1990, p. 312). There is one such event experienced at JH that must be considered within the context of this study. This event restricted the availability and merit of some baseline data. During the spring of 1993, teacher job action impacted the availability of relevant statistics (especially in the areas of attendance and reporting) which normally would have been consulted for this study. Students also missed a significant portion of instructional time during the labor disruption. The early stage of timetable innovation already makes it difficult to consult potential pre-test data, but the absence of some baseline data enhances the concerns in this area.

A second threat to internal validity has been termed 'maturation'; a process that operates "...within the subjects simply as a function of the passage of time and may produce effects that could mistakenly be attributed to the experimental variable" (Ary, 1990, p. 312). JH evolved from a junior secondary (grades 8 - 10) towards full secondary status and moved into a new facility at the same time that the Copernican Model timetable was being implemented. School cultural and socio components likely endured significant variations as new patterns and traditions were being established. Over time one would certainly anticipate teacher and student maturation, based on their initial

experiences with a quarter system macroclass timetable. It is possible that the Hawthorne Effect may also play a role in this maturation process. The integration of quantitative and qualitative methodologies enabled the investigators to attain an understanding and identification of the meaning that students attributed to such a period of adaptation and experiential development.

A third potential threat to the internal validity of this study relates to the measuring instruments. While the investigators were able to maintain control over procedures involved in the interview component of the study, the same cannot be said for the survey. Efforts were made to provide the English teachers who administered the survey a detailed guideline of procedures. Nonetheless, verification of adherence to procedures is difficult. Another possible concern relating to the measuring instruments involves the teacher assigned letter grades. At JH the school administration has pointed to notable increases in the total number of students on the honor roll. One might argue that this phenomenon is related to a less rigorous evaluative approach on the part of the teachers, or merely a gesture supportive of the implemented timetable. However, such arguments can be countered with analysis of standardized exam and government final exam results.

Aspects affecting external validity of this study must also be given consideration. External validity primarily refers to the ability to generalize findings and determine whether these same findings could be obtained in another setting. Quantitative and qualitative practitioners are likely to acknowledge that external validity limitations do exist in a study that extends across as many potential variables as this one does. The many unanticipated variables (i.e.., teacher inservice opportunities related to instructional methodologies) encountered within this research project may be the cause of observed relationships and therefore the investigation must be considered a

quasi-experimental study. Wherever possible, procedures have been implemented to identify and/or reduce the potential role of such variables. Such procedures would include triangulation methods where the question response is appraised via both qualitative and quantitative instruments. Survey items also included some question reversals (manipulation) to permit an additional check on the validity of responses. Finally, claims of external validity can certainly be enhanced if one is able to replicate results found in other studies. As the field of inquiry concerning Copernican Model timetables expands, so too will the ability of researchers to formulate causational relationships.

CHAPTER FOUR: RESULTS AND DISCUSSION

The purposes of this chapter are to: (a) report and discuss the qualitative and quantitative research findings of this study; and (b) acknowledge the parallels between the results of this study and other investigations of Copernican Model timetables. Portrayal of results and ensuing discussions will draw on both quantitative and qualitative assessments to maintain the integrative theme established early in the research process. This chapter is comprised of four sections. The first section examines the broader concepts of student satisfaction and related notions of effective schooling. This is followed by a brief overview of school based statistical data reflecting student achievement including a description of the provincial government exam results. Section three explores some of the fundamental issues that have been associated with the Copernican Model timetable via a student's perspective. The chapter concludes with a brief summary statement. Each section reveals student perceptions and understandings as reflected in the field notes, questionnaire, written responses and interviews.

The Big Picture

Fullan establishes an imperative perspective when he asks the question: "What would happen if we treated the student as someone whose opinion mattered in the introduction and implementation of reform in schools?" (1991, p. 170; Rudduck, 1991). Such a premise was instrumental in developing the student questionnaire for our study and governs much of the analysis and discussion that ensues. Prior to embarking on analysis of the research data, it is necessary to reflect upon several aspects of the proverbial 'big picture' in the educational setting. Effective schooling and restructuring literature has provided

an indication of what works well in the educational realm and, at the same time, has acknowledged that student attitudes towards school and levels of interest in schooling are very important measuring sticks (Goodlad, 1984; Sizer, 1991; Conley, 1993).

It is with these considerations in mind that several rather generic questions were included in our student questionnaire:

19. I am satisfied with the amount of schoolwork that I am completing.
22. I enjoy school.
23. The subjects covered in my classes are interesting.

Fullan (1991) had addressed students with similar questions in his mammoth survey of Ontario schools. He reported that findings were largely "indicative of what we labeled generally 'the alienation theme'." (1991, p. 171). Approximately 70% of student responses centered on a neutral or negative reply with the other 30% of responses representing positive attitudes. Fullan goes on to provide the following summation: "one out of every two high school students, reported that 'most of my classes or lessons are boring" (p. 171). Where possible and/or appropriate it may be useful to compare findings from this study to those of Fullan.

A graphic representation of grouped student responses to questions numbered 19, 22, and 23 are shown in Figures 4, 5 and 6. The graphs provide for a comparison of responses between all three schools. The response categories "strongly agree/agree" and "strongly disagree/disagree" having been combined for ease of representation. An analysis of variance procedure was performed on each of the three questions. The F-value for question number 19 was 6.52 and $Pr > 0.0017$ indicating the difference between the JH responses and those of schools 'A' and 'B' to be significant. However, as with any analysis of statistical difference, one cannot automatically assume that significant

difference equates with causation. It should be noted that similar levels of student 'satisfaction' with school have been noted at other Copernican Model sites (see Table 1, p. 31) including the original experiment at Masconomet High School.

Figure 4

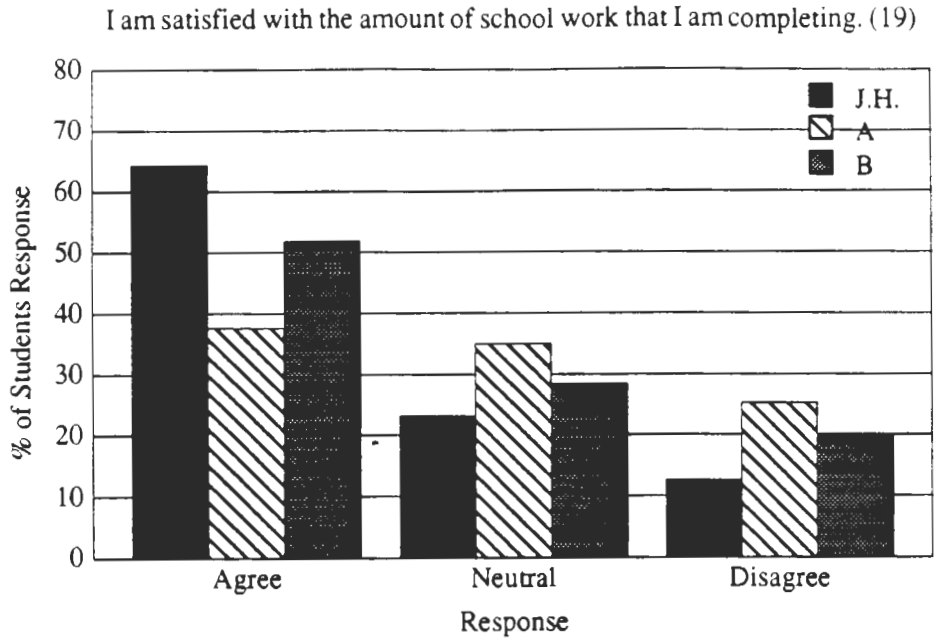


Figure 5

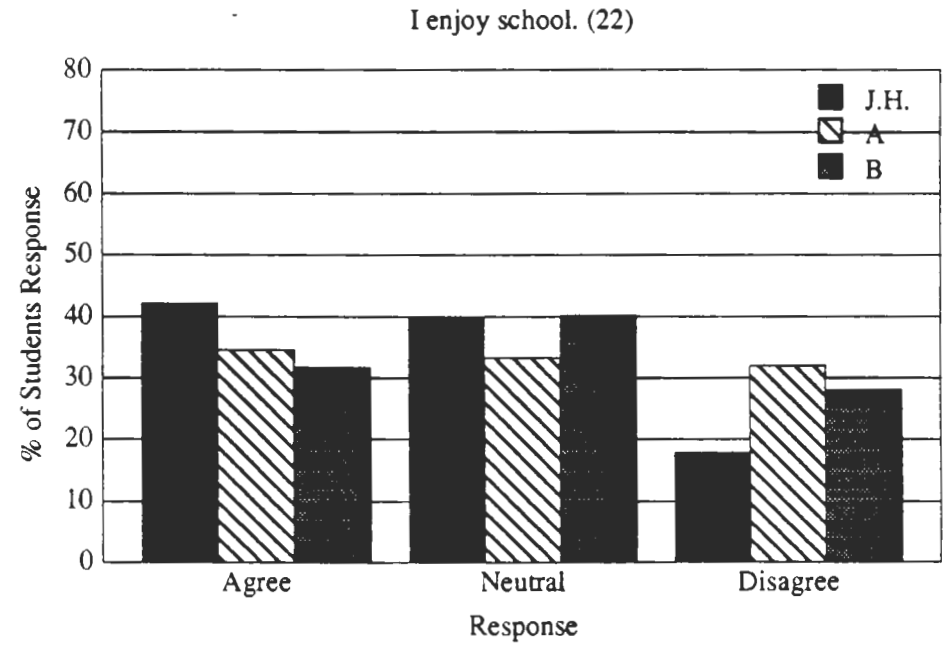
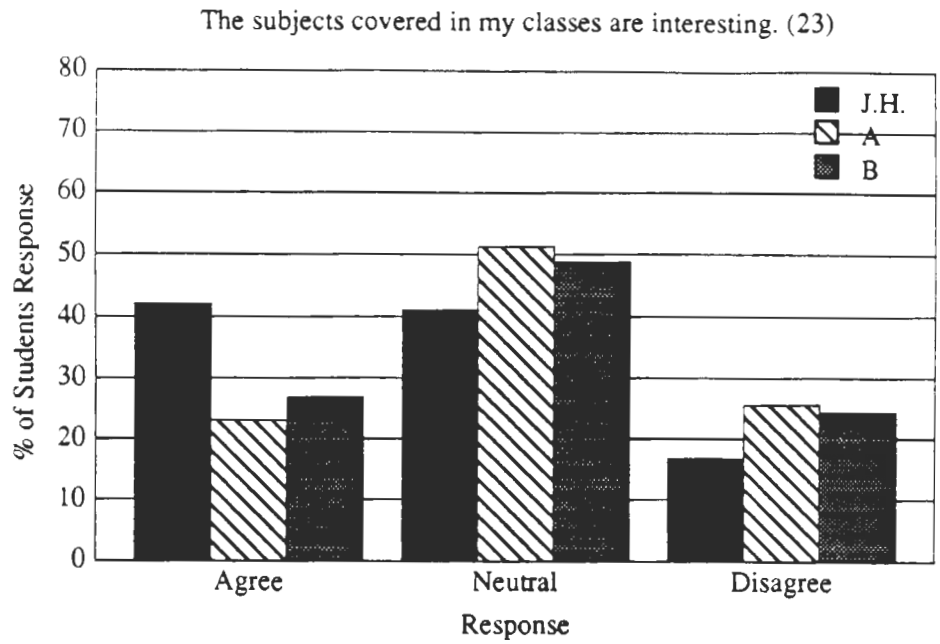


Figure 6



The findings associated with question number 22 (I enjoy school) are similar to those cited by Fullan. The F-value for this question was 1.82 with Pr > 0.1642 and the findings thus are not significantly different. Nonetheless, this question is worthy of further examination. We suggest that the responses have strong implications for educators. Figure 5 provides an indication of the substantial percentage of neutral responses associated with each school on this question. Such circumstances have previously prompted Fred Newmann to conclude that "most young people complete school only as a ritual" (as cited in Conley, 1993, p. 86). The challenge to promote an organizational and curricular structure that facilitates a meaningful engagement of this group of students is a sizable one.

It is question 23 (The subjects covered in my classes are interesting) which comes closest to the essence of student engagement at school. Again, a substantial number of students did not offer a positive response to this question (see Figure 6), although, it should be noted, that Fullan did encounter

responses that were even more distressful. Variance analysis of this question yielded an F-value of 3.91 with Pr > 0.0213 and the findings were thus deemed to be significantly different between JH and both schools A and B.

We must now ask where this leaves us in relation to assessment of the Copernican Model timetable at JH. There are four points to consider. Firstly, the effective schooling literature indicates that student feelings about school are very much related to the extent of their educational engagement. Secondly, JH student responses towards these questions were relatively positive, especially when compared with results from school 'A' and 'B' (statistically significant differences were noted for two of three questions). Thirdly, inferences from recent literature on timetables suggest that scheduling is one of the major factors in developing a productive and positive ethos in schools (Conley, 1993; Dempsey and Traverso, 1983; English, 1993). Oakes (1985) goes on to describe scheduling decisions as the most significant decisions that a school will make. Finally, the obvious distinction between the three schools that participated in the survey is their scheduling formats.

Student Achievement at JH

Assessment of student achievement can take into consideration a variety of different statistics ranging from failure rates, to levels of homework completion, to provincial examination results, to percentage of students on the honor roll. This listing is not meant to be all inclusive, but merely an effort to illuminate some possible avenues of investigation. One should also note that not all indicators of student achievement are easily measurable or accessable. Let us begin by examining the students' own perspectives on their achievement levels.

TABLE 3: Survey Questions on Achievement (Responses in %)				
	School	S.A./A	N	S.D./D
44. My grades have been dropping.	J.H. A B	24.17 31.95 32.90	23.08 27.78 28.95	52.74 40.27 38.15
63. I have been more academically successful in my courses on the "Quarter System Timetable".	J.H.	47.13	31.03	21.83

Table 3 isolates the two questionnaire items that specifically referenced academic achievement. Response tendencies do favor JH students. Close to 50% of JH students felt that they had improved academically. In each case a comparison of the positive and negative response percentages for each school is revealing. Student comments and discussion provided during the interview process yielded valuable insights and perspectives on rising academic achievement levels and their related causes. Several students confirmed increased levels of academic success and attempted to rationalize their improvements:

> I like this timetable. Before my grades were C+ and B. Now my average is an A. It is much easier to concentrate and study for tests when I have less classes to think about. I was shocked that I even made it on the first class honor roll.

Another student afforded similar results with a slightly different rationale:

> Maybe it (improved academic achievement) had a bit to do with the fact that there was more time to ask the teacher questions, there was more time for teachers to walk around and make sure students understood everything and in a lot of cases the class sizes were a little smaller last year.

One student brought a vastly different perspective when he stated, "I don't really think any students are doing that much better than they did before. I think this is an experimental thing, teachers are marking easier. This is how our French teacher explained it to us." This perspective was subsequently corroborated through a teacher interview and later dismissed as being "unlikely" by another teacher who cited departmental controls and the provincial exams as checks on this theory. Several other student comments regarding academic improvement are worthy of note:

> I myself improved, I made the honor roll, I think it is because you are concentrating on those courses so much. The final exam comes around and you remember everything that you've learned from the first day of class. You have the ability to go into depth. With the eight class system you were in there, then you were gone and you didn't have the class again for two days. Recall for final exam you couldn't remember for the life of you what went on during the first month or two of school.

The following comments reflect the image that a particular student constructed on how the changes in class time configurations impacted her ability to interact with teachers and subsequently improve academic standing:

> ...think it really has to do with the teacher. In the old system had only a minute or two with the teacher. Now can really spend time with students. Can now really help students with the help they need...also with stress level, pushed for time so want to try harder to pass, so put more time into homework and actually working in class.

One student had a few 'exceptional' things to say about the timetable, "This new timetable has improved my academic standing as well as providing a want and need to learn. It is an exceptional timetable with the exception to the problem with music."

The dialogue with students clarified some of the valued attributes of the Copernican Model timetable from a student perspective. Important timetable attributes linked to avenues of success were: an ease of organization and focus; substantive conversation time, especially with the teacher; the ability to delve into an issue for extended periods of time; and the elements of pressure associated with a course that is completed in ten weeks. Now let us turn to a brief examination of school based data that is often linked to analysis of student achievement.

Baxter, the principal at JH, describes some recent characteristics of student achievement at his school: "Since 1987,...the number of failing grades issued at any reporting period has been 11 to 13 per cent. At the end of Term 1 in November of 1992 (after implementation of Copernican Model), the number of failing marks totaled 8.4 per cent. Our honor roll, which usually runs between 20 and 25 per cent was 36.5 per cent in the same period."(1993, p. 2). Baxter went on to describe attendance at JH as having always been good, but as improving slightly since implementation of the Copernican Model timetable. This analysis helped determine the framework of the strategy for our assessment of achievement levels at JH.

Attendance has often been portrayed as one of the pillars supporting student educational success. School attendance rates may also be perceived as a partial indication of student interest and satisfaction, two attributes that were discussed previously. Table 4 provides details on JH attendance rates by grade beginning with the 1991-92 (91-92) school year and concluding with the

1993-94 school year. Student numbers have been included to convey the changing population dynamics during this period of time. At first glance there would appear to be considerable improvements during the Copernican Model timetable implementation year (92-93). Subsequent investigations revealed that at least two factors contributed to these inflated figures. Firstly, all students were deemed to be in attendance during the teacher strike. Secondly, the implementation of a new attendance system enhanced the chances of entry errors as teachers became accustomed to the new software and hardware. The 93-94 attendance data provide a better opportunity for comparisons and do show slight improvements over the 91-92 data. Caution must be observed in making direct comparisons using only the total attendance figures, as JH had not yet added grade 12 in 91-92.

Table 4: J.H. Attendance Rates (%)

Grade	91-92	N	*92-93	N	93-94	N
8	95	335	98	329	97	381
9	93	314	98	351	96	325
10	94	301	97	332	95	350
11	93	214	96	345	94	336
12	–	–	97	236	92	319
Totals	**94**	**1164**	**97**	**1593**	**95**	**1711**

* Implementation Years

N Student Population

TABLE 5: QUANTITATIVE ANALYSIS OF EXTENDED RESPONSE QUESTIONS

"Some strengths of our school timetable are":

# of respondents by grade

9	10	11	12	Total	Category Response
7	9	13	10	39	• better able to focus and easier to organize
6	9	8	4	27	• rate of course completion
3	4	9	6	22	• less exam pressure
0	4	0	0	4	• other

"An important change that would make the school timetable better is:

# of respondents by grade

9	10	11	12	Total	Category Response
1	5	13	3	22	• change to a semester/linear system
2	4	5	1	12	• reduce the pace and pressure
3	2	2	2	9	• adjust lunch time
5	5	8	4	22	• other

"The greatest difficulty that our current timetable presents for me is":

# of respondents by grade

9	10	11	12	Total	Category Response
7	7	9	3	26	• pace is too intense
1	7	8	2	18	• impact of time missed from school
1	5	1	6	9	• retention of materials
2	7	11	0	26	• other

"Please list any subjects that you feel do not work well with the way the school timetable is set up":

# of respondents by grade

9	10	11	12	Total	Category Response
6	7	17	7	37	• Math
9	4	12	6	31	• Sciences
1	2	7	4	14	• Languages
3	10	13	8	34	• Other

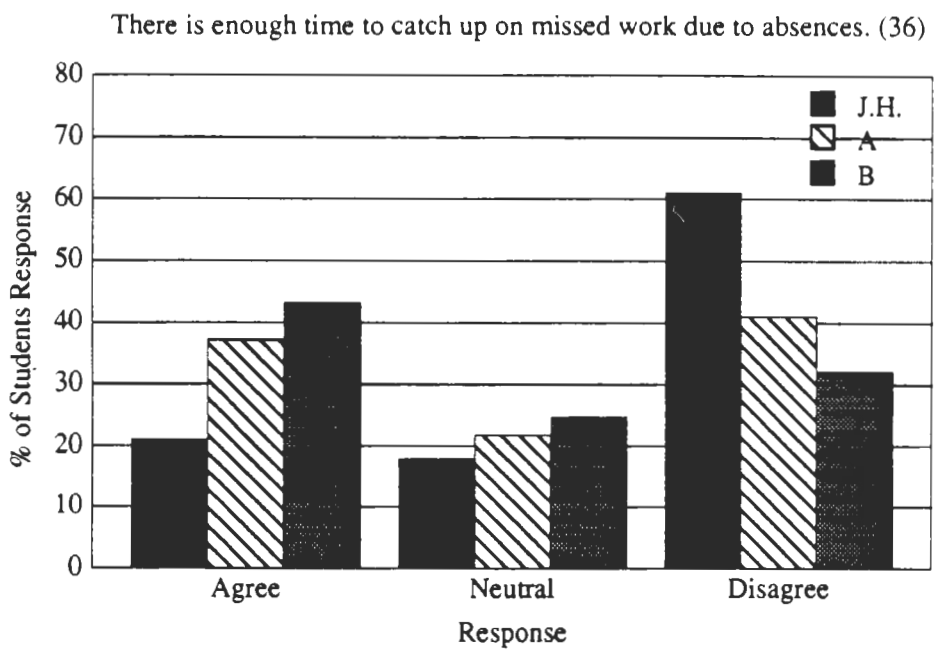
Logically, one must now consider student perspectives on attendance. Student comments related to the impact of time missed from school were the second most frequent type of concern expressed about the Copernican Model timetable (see Table 5, p. 60). Sentiments along the lines of "...the time goes so quick, and then if you happen to be sick, you miss a week's worth of work" were commonly stated. Some students did relate personal experiences, "With this timetable if you are absent you are in big trouble. Was in hospital and had to get a tutor". Figure 7 reinforces the perceived relationship between timetable and impact of absences. The analysis of variance yielded an F-value of 7.52 with $Pr > 0.0007$. The analysis indicated a significant difference between JH and both of the other schools. Of course, some students did provide a viewpoint that could be construed as positive: "...now it is a lot harder to skip, if you skip you miss a lot". Could such a philosophy be associated with better attendance and correspondingly with improved grades?

An effort was made to complete a marks analysis for grade 10 subjects at JH covering the period 1989 to 1994. Unfortunately, only the 93-94 data was available. Nonetheless, Table 6 reveals an impressive level of student performance with over 50% of assigned grade 10 marks being As or Bs. Similar results have been cited at other Copernican Model schools including New Westminster Secondary where Jorgensen notes an "8.4% increase in the number of As and Bs" (1993, p. 59).

Table 6: 1993/94 Johnston Heights Marks Analysis, Grade 10

Letter Grade	A	B	C+	C	F	SG/P	Totals
Totals	738	705	356	300	229	389	2717
%	27	26	13	11	8	15	100

Figure 7



A standardized form of test, such as the Grade 12 Provincial Exams, often afford the best opportunity for comparative achievement analysis. However, caution needs to be exercised when interpreting these results. Often, a small school based subject sample size can promote misleading conclusions. In 1992-93 JH not only implemented a Copernican Model timetable, but offered a grade 12 program for the first time. One might expect a period of adjustment before such a school came in line with provincial 'averages'! A three year

comparison (1992-94) of grade 12 provincial exam results is represented in Table 7A and 7B. The results speak favorably for JH students and staff. Almost without fail, the JH exam success rates exceed those of the province. In the 93-94 school year, JH mean exam scores in Biology, Chemistry, English, English Literature, History, Mathematics and Physics all exceeded both the district and provincial averages. The biggest differences between the school result and the provincial averages were in History, Chemistry and Physics (6.9%, 6.6% and 5.1% respectively). Communications, Geography and French fell below the district and provincial averages (2.1%, 3.6%, 1.1% respectively). Exam participation rates were relatively similar to district and provincial averages.

The provincial exam results for JH were not unlike those findings being reported by some of the other Copernican Model schools in the province. Hierck and Veregin (1993, p. 14) indicate that for 1992-93, "on the exam component, L V Rogers' students had a higher mean score in eight of the nine subject areas". New Westminster Secondary also reported improved provincial exam results during their first year on a Copernican Model timetable (Jorgensen, 1993, p. 65).

Students of JH offered some explanations for their provincial exam performance: "...better able to focus and easier to organize for exams", and "..."there is less exam pressure all at once and you can spread your exams throughout the year." Several students reiterated the value of being able to write some of their exams at the conclusion of a quarter when everything is relatively fresh in their mind (see Appendix B-1, p. 104, Question #59). Such commentary, of course, has prompted critics to stress concerns regarding student retention. And, as with any proposition, one does need to explore the issues and their potential implications.

GRADE 12 EXAMINATION RESULTS
THREE YEAR COMPARISON - 1992 TO 1994

Table 7A

Source: Ministry of Education, Examinations Branch

SUBJECT	JOHNSTON HEIGHTS SECONDARY				SCHOOL DISTRICT #36 (SURREY)				BRITISH COLUMBIA			
	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate
BIOLOGY												
1991/92					61.6	80.5		90.9	64.0	82.5		93.2
1992/93	74.9	95.8		95.8	64.3	80.4	18.0	92.9	67.2	86.1	23.9	94.3
1993/94	68.7	88.1	24.5	91.8	65.4	81.2	22.7	93.1	67.6	84.1	24.7	94.3
CHEMISTRY												
1991/92					64.3	83.5		93.0	70.0	88.5		95.6
1992/93	68.4	87.2		97.9	62.3	74.7	14.6	89.8	67.5	84.5	20.5	94.2
1993/94	73.5	92.0	20.5	96.4	62.5	75.5	17.1	92.4	66.9	83.3	21.2	94.4
COMMUNICATIONS												
1991/92					60.9	82.0		90.5	62.6	84.8		92.8
1992/93	62.0	68.8		93.8	60.7	75.5	11.4	88.8	63.1	81.9	11.7	92.5
1993/94	64.3	90.0	9.7	92.5	63.9	83.0	10.1	92.3	66.4	88.5	10.7	93.9
ENGLISH												
1991/92					67.2	90.2		94.8	68.2	91.3		96.1
1992/93	66.9	90.2		98.4	66.3	90.6	69.6	94.7	68.6	91.8	70.2	96.0
1993/94	66.3	90.0	73.2	96.8	63.8	86.2	69.3	94.2	65.7	88.5	69.4	95.5
ENGLISH LITERATURE												
1991/92					65.6	86.9		91.5	66.6	88.4		96.0
1992/93	69.1	94.7		100.0	66.5	89.2	9.1	94.9	67.6	91.2	9.2	96.7
1993/94	66.8	97.1	8.2	100.0	66.0	90.8	8.5	97.5	64.9	88.3	8.7	96.0
FRANCAIS LANGUE												
1991/92					70.9	97.2		100.0	76.1	99.1		99.7
1992/93					69.7	97.2	2.5	100.0	72.3	96.9	1.9	99.2
1993/94					71.3	97.4	2.3	100.0	69.5	96.6	1.9	98.5
FRENCH												
1991/92					66.5	90.3		97.6	68.0	90.7		98.2
1992/93	61.0	79.6		100.0	63.0	81.7	11.8	95.9	67.8	88.9	14.4	98.1
1993/94	65.8	87.5	11.8	100.0	64.7	85.1	12.6	95.5	69.4	90.4	13.3	98.0

GRADE 12 EXAMINATION RESULTS
THREE YEAR COMPARISON - 1992 TO 1994

Table 7B

Source: Ministry of Education, Examinations Branch

SUBJECT	JOHNSTON HEIGHTS SECONDARY				SCHOOL DISTRICT #36 (SURREY)				BRITISH COLUMBIA			
	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate	Mean Exam Score	Exam Success Rate	Exam Participation Rate	Course Success Rate
GEOGRAPHY												
1991/92					66.2	90.9		94.7	64.4	89.3		95.6
1992/93	60.4	87.8		100.0	61.8	84.4	16.8	92.4	61.3	82.8	19.1	94.0
1993/94	63.1	91.1	11.1	95.0	65.2	84.1	14.4	94.9	64.2	86.6	17.5	95.1
GEOLOGY												
1991/92					63.6	84.5		94.8	64.4	82.6		93.5
1992/93					55.8	77.5	3.4	92.0	59.9	78.5	2.2	93.1
1993/94	28.0	0.0	0.1	0.0	23.1	63.3	3.3	93.4	59.0	72.2	2.6	91.2
GERMAN												
1991/92					84.6	100.0		100.0	69.9	84.9		96.4
1992/93					98.0	100.0	0.3	100.0	68.6	86.6	0.5	97.2
1993/94	72.3	100.0	0.8	100.0	75.6	92.9	0.4		65.8	73.4	0.5	90.8
HISTORY												
1991/92					62.2	85.7		94.9	63.3	85.6		93.9
1992/93	70.9	90.5		97.6	64.3	85.9	14.5	91.6	65.4	88.1	17.3	94.7
1993/94	73.5	100.0	9.7	100.0	67.0	89.8	12.9	96.0	66.6	89.0	16.2	94.9
MATHEMATICS												
1991/92					62.2	77.2		89.3	65.1	83.1		91.4
1992/93	69.5	88.9		94.1	61.2	71.9	25.4	87.9	64.0	80.5	33.2	90.8
1993/94	66.3	83.6	28.7	90.3	61.8	72.5	29.9	88.2	65.8	80.2	34.6	90.6
PHYSICS												
1991/92					64.9	77.1		88.3	68.5	84.4		93.2
1992/93	66.3	82.6		86.4	64.5	76.0	7.9	89.0	69.8	85.4	11.6	94.3
1993/94	74.7	94.7	8.7	97.2	68.4	82.6	9.5	93.8	69.6	84.5	12.5	94.2
SPANISH												
1991/92					72.2	92.3		100.0	67.3	78.6		93.5
1992/93					76.0	94.3	1.1	96.9	73.4	88.8	0.9	97.5
1993/94	60.8	73.3	3.9	100.0	71.5	87.5	1.0	100.0	77.3	94.4	0.9	98.0

The Copernican Model: Some Fundamental Issues

An examination of the key attributes and issues associated with the Copernican Model timetable at JH is in order. Seven focus areas, ranging from structure, to retention, to methodologies, to the overall attitude and outlook of students, were targeted for extensive analysis. Student comments were solicited through formal and informal networks.

Structure. Let us again begin with a question. What makes this timetable work for students? As part of the extended answer questions, students were requested to identify some strengths of their timetable. The number one response came under a category entitled 'better able to focus and easier to organize' (see Table 5, p. 60). Careful analysis led to a distinction between 2.5 hour classes which allowed one to really delve into an assignment, and only having two classes at any one point in time to concentrate on. Amongst the twelve students who were interviewed, nine indicated that only having two classes to focus upon greatly eased organizational pressures and therefore was the most significant attribute of the timetable. Three students maintained that both factors were equally important. Figure 8 displays the comparative data on survey question number 35 which states: "Our school timetable makes it easier to stay organized". The analysis of variance procedure yielded an F-value of 5.70 and $Pr > 0.0038$. A significant difference was therefore noted between JH and both of the other schools.

When questioned further on class length, 25% of interview respondents indicated that they would recommend shorter periods. One student succinctly stated that, "It is difficult staying in one room for 2.5 hours and staying on task." Survey questions 58, 62 and 64 target JH student feelings on the issue of class length. Results for these questions are represented in Table 8.

Figure 8

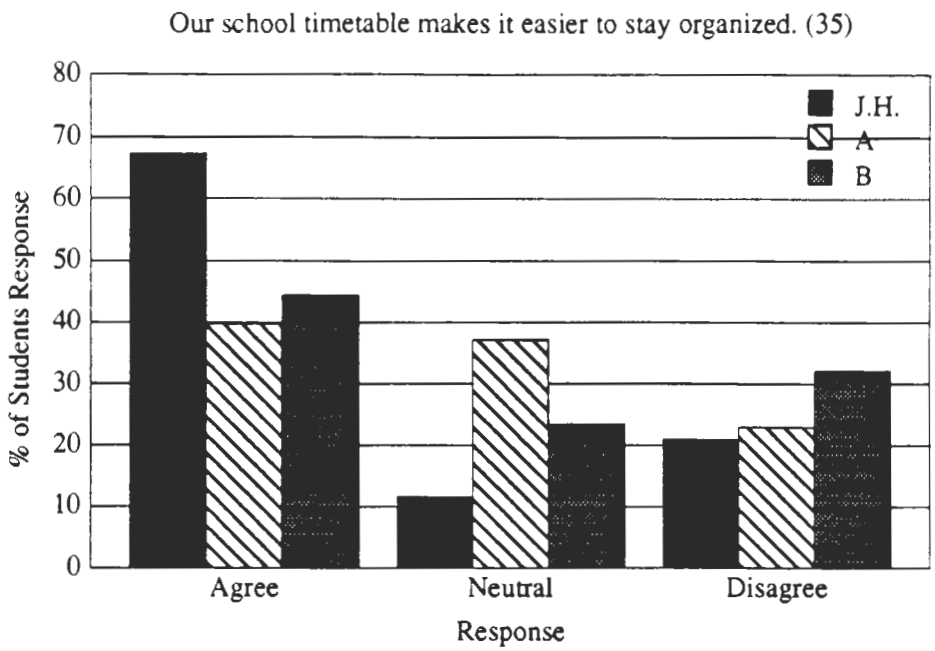
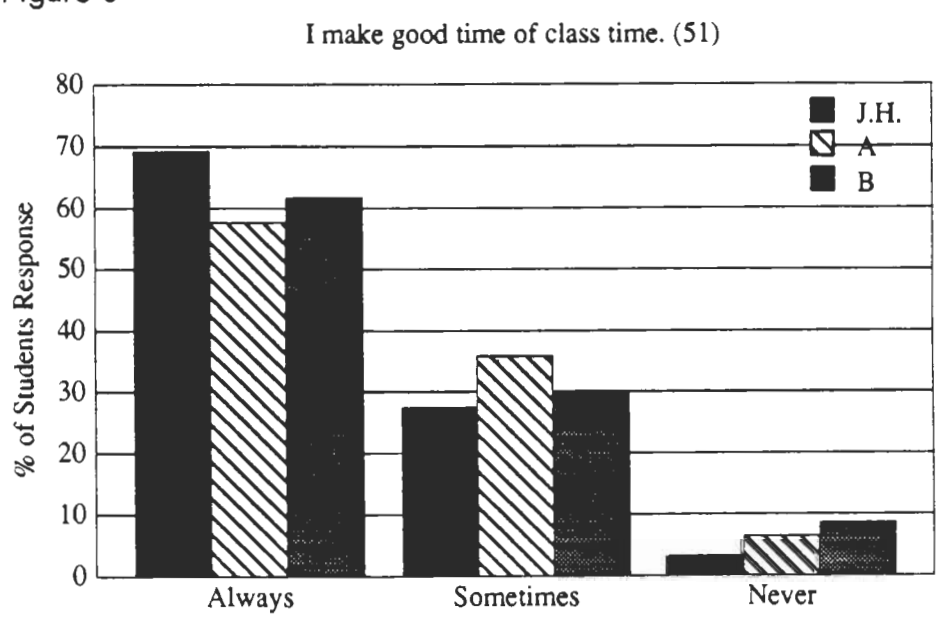


TABLE 8: Survey Questions on 2 1/2 Hour Classes				
	School	S.A./A	N	S.D./D
58. Two and one-half hour classes every day are too long.	J.H.	39.77	35.23	25.00
62. I have a tough time staying on task during a two and one-half hour class.	J.H.	42.05	29.55	28.41
64. I am able to stay focused and keep my attention fixed during class.	J.H.	41.95	36.36	21.58

Although JH students were somewhat critical of class length, a clear majority felt that they were able to make good use of class time as revealed by survey question 51(see Figure 9). Only 3.3% of JH students stated that they seldom or never make good use of class time. The analysis of variance procedure indicated that there was no significant difference between student responses from the three schools on this question (F-value 2.6, Pr > 0.0759). When prompted to provide some possible solutions to their concerns over length of class time (while at the same time valuing only taking two courses at one time), one very astute grade eleven student suggested that, "keeping focus within the system important. Have 75 minute classes, then 10 minute break, but that's not enough. Maybe switch (alternate) courses, but have 2.5 hours still each course per day." The student went on to elaborate that it may be possible to have 1.25 hour classes such that one day may start and end with the same class and the other class could be interspersed with the lunch period. Such a schedule would alternate daily. Some students had clearly given some of these matters considerable thought, thereby stressing the value and importance of student consultation.

Figure 9



Another element of the timetable structure at JH is the extended period of time in the middle of the day. Baxter (1993, p. 2) indicates that this time: "...allows for additional student selected learning opportunities - such as, tutorials, fitness activities, advisory groups for Grade 8's, music maintenance, intramurals, assemblies, course selection, student council meetings, pep rallies, test-taking, etc. Students in Grades 8 through 10 are required to attend 50 minutes of activities each week and report their participation in portfolio form." This element of time within the school week is known as 'flex time'. Theoretically a student could complete their flex time requirement within one day or have it spread over several days.

Both survey and interview respondents were very critical of flex time. Less than 30% of survey respondents agreed that flex time activities met their goals and are useful. When students were questioned about their understanding of flex time they offered the following observations:

> I don't really use them. I don't know anyone who has gone to flex time activities.
>
> (first a snicker and then laughter in responding) They are not even calling it flex time anymore, teachers have study sessions. Basically, like everyone else in the school, I have a 70 minute lunch.
>
> What I hear is teachers needed more time in the school year. I use flex time a lot because lots of my activities use this time for rehearsals, etc. It is easy to use up flex time if you are involved, but a lot are not. I see lots of it going to waste, lots of people go to the mall.
>
> There is no purpose, I see them as extra time where you have fun. Says in the agenda where you have to have 15 minutes a week. It is ridiculous. It's your time.

Several students suggested the elimination of flex time activities or making such activities mandatory, therefore bringing greater accountability. When students

responded to questions related to flex time they displayed a certain assuredness or confidence. This was visible evident in their body language and willingness to provide considerable elaboration on this issue. Student feelings were decisive and they were able to clearly articulate and rationalize their positions on the issue.

Retention. The issue of student retention is certainly related to the Copernican timetable structure. A student could theoretically have up to eighteen months elapse between completion of one course in a particular discipline level and the commencement of a subsequent course within that discipline at the next grade level. Students did express this issue to be of some concern, with the written student responses ranking retention third amongst difficulties noted with the timetable (see Table 5, p. 60). The actual degree of difficulty presented by this issue is difficult to gauge when relying simply on student impressions. Evaluative measures such as the Gap tests (given to students at Masconomet High School) will provide better levels of understanding in this area.

JH students did respond relatively favorably to the retention related questions in the student survey as displayed in Table 9. The interview questions on retention tended to be much more illuminating. Several students acknowledged that this issue was of some concern but they were quick to clarify that coping strategies did exist. Three students indicated that school counsellors addressed their particular concerns about lengthy intervals between courses by making timetable adjustments where possible. Other students did not anticipate any real difficulties:

Table 9: Retention of Materials				
	School	S.A./A	N	S.D./D
28. I am able to remember the material presented in class.	J.H.	58.51	31.91	09.58
	A	39.75	41.03	19.23
	B	51.85	29.63	18.51
29. I am able to remember the material presented in a course.	J.H.	43.16	42.11	14.74
	A	37.18	41.03	21.79
	B	37.04	43.21	19.75

> I think that if teachers do a good review when you first get back into the class it will all kind of come back. I don't know what you call it, but...when you learn something, you lose so much of it, then you won't lose any more. I found the first couple of weeks of French a little difficult, but after we had finished the review, which my teacher did a very good job of, it all came back to me.
>
> ...teachers know our level, they start almost with a clean slate, lot of teachers helped. I lucked out with good teachers this year. For myself, having friends taking it in different terms and helping them out really helps.

Another student made the distinction between short term and long term memory:

> Everything does go pretty quickly, so it is good for short term memory sort of thing, but by the time it comes around the next time a lot of it is gone. Sometimes the intervals are pretty long.

Several students commented on the strategies they employed to alleviate the concerns surrounding the retention issue:

> I usually keep all the work that I've done and at the end of the summer I usually go over it to make sure you have an idea of it. I'm more into the academic work, some of my friends just throw away their binders, but I usually keep mine. I think that more people keep their books in this system than in last years because we had courses till the end of the year and now courses end near the beginning of the year and it is harder to remember.
>
> I even know some people who sold their notebooks. It is just a lot easier if you talk to someone to get an idea of what the course is all about, find out what you have to do.

After further probing, students generally acknowledged that teachers also have developed strategies to counter problems created with borrowed (or for that matter, even bought) materials. One student felt that teachers were relatively aware of what was happening and that some of her teachers retained tests and large projects.

Suitability. It has been suggested that the structure of a Copernican Model timetable does not work well, or is not in the best interests, of all subjects. Carroll (1990) had noted this concern and suggested that some subjects may be best suited to a full year program that could be incorporated within the Copernican Model. In particular, Carroll referred to Band where he emphasized an imperative need for continuity over a period of time. Several high schools in British Columbia have made such an adjustment to their Copernican Model timetable.

JH survey participants were requested to list any subjects that they felt did not work well with the Copernican Model timetable format (see Table 5, p. 60). Math ranked first and was followed by the Sciences and then Languages. Several elective courses such as Band and Drama comprised the bulk of the 'other' category. Students were certainly able to offer opinions on why a particular subject did not work well within this timetable framework:

> The nature of the course important, some courses take time, they can't be rushed...can't expect to learn a years' music and keep that level only in 10 weeks. Takes time to develop. Math is hard because of so many concepts, takes me time to learn new one, learn one then get another and just snowballs.
>
> Math is not (well suited) as some people take a long time to grasp, should be year long course so we can learn it without pressure. P.E. is not good as should not have 10 weeks of physical activity, then 40 weeks off. Hard ones like Sciences should be spread over time, need to have a longer time to learn the material, 2X20?, creates less pressure.
>
> In Science I did not get enough experience, hands on stuff, because the teachers have to get straight to the point and there is not as much time. We didn't do any dissections or any of that hands on type of thing in order to reinforce what I was learning so it was more like fact, fact, fact, memorize, and then we're on the next thing. And I just couldn't handle that.

Some students did question the concern over suitability of the timetable for certain courses. They were quick to point out that students did have preferred learning styles and capabilities. One student also addressed the teacher factor: "...really depends on the teacher too, those who know how to use it (2.5 hours) to their advantage...really worked well." A common concern related to the suitability of academic courses involved student comments which touched on aspects of course pace and resultant pressure. This area warrants further investigation.

Pace and Pressure. Approximately one third of all students completing the extended response survey questions cited pace/pressure as the greatest difficulty presented by the timetable (see Table 5, p. 60). Seven items from the questionnaire were directly or indirectly related to pace and pressure. These questions were grouped as a scale that we referred to as pace and pressure. Questions included in this category are:

16. I find it easy to make time for extra-curricular activities.
20. I feel confused and stressed about school.
28. I am able to remember the material presented in class.
29. I am able to remember the material presented in a course.
30. The pace (speed and demands) of most courses is appropriate.
32. I have enough time with my teachers for individual help.
42. Too much material is covered in class every day.

The analysis of variance procedure was applied to this scale and the results indicate that differences between the three schools are not significant. The F-value is 1.37 and Pr > 0.2555, a result that could be taken as a positive showing for JH. Generally, students may have similar ways of viewing and understanding stress and clearly what is a stressful situation for some students will not be a stressful one for others. The change process in this particular case would force some students to realize a new set of coping skills that could be employed to reduce possible stress levels.

An examination of student interviews did illuminate the situation, and as anticipated, several differing student perspectives emerged. Four variations of student perspectives could be clearly identified. Firstly, a common response included statements like: "...there is pressure but it feels good and forces you to accomplish things," and "...because certain people, with what they do in the future, deal with a lot of stress and this way they get used to it." These viewpoints represent the 'pressure is good' contingent. Secondly, there was a group of students who seemingly become overwhelmed by the pace/pressure:

> ...Biology, it was flying right over my head. I mean I totally flunked that class. I learned something, was tested next day, failed the test, given a project, couldn't understand the project, so didn't do it, didn't want to go in for any extra help, just hopeless, it all just crawled up behind me. I ended getting 35% in the course. Normally I am an honour roll student. I've been on the honour roll since grade 8, I had straight As all through elementary school. This is the first class that I've had any less than a B in. It is too concentrated!

> ...they go too fast, your teachers rush you too much, they make you do everything right away, if you have a deadline for a project then you can't hand it in any later because then we're into a new subject.

Some of these students did acknowledge that it may be a matter of retooling their repertoire of coping skills to meet the slightly differing pressures of a Copernican Model timetable. Thirdly, we had a group of students who feel that the new timetable system actually reduced stress levels. These sentiments can best be summarized by statements such as: "...only having to concentrate on two classes relieves the stress", and "...have more time to concentrate on their courses, don't have to worry about so much homework from so many teachers." A fourth category of respondent identifies possible stress sources but also acknowledges system support mechanisms that help to counter this possible stress:

> My experience with the quarter system was I find it fine because the counsellor arranged it so that I had my hard courses in the afternoon and some of the easier courses in the morning for each of the terms so I'm not over-burdened with too many hard courses.

An interesting extension of this analysis could involve efforts to establish if a similar set of perspectives on pressure/pace exist at schools A and B. Some interesting questions also come to the forefront. What impact would student in-service bring, especially in terms of preparing some of these students to recognize specific skills that may be needed by such a timetable change and how could one best develop student coping skills?

Methodology. In discussing particular student perceived issues related to the Copernican Model timetable, the teacher and/or their use of instructional

strategies were often cited as being the key elements of "a viable and workable classroom situation" (from student interview). The questionnaire included eight items which specifically focused on methodologies/instructional strategies. This group of questions became known as the methodology scale and consisted of the following questions:

7. My teachers use various different types of instruction to help me learn. (i.e.,) group work, lecture, projects, videos
9. My teachers use materials taken from sources other than the textbook.
11. My teachers assign independent projects.
45. In my classes, we work in small groups.
46. n my classes, students give presentations.
47. In my classes, we have discussions.
48. Information presented in class comes from teacher lectures.
53. My teachers present lessons together.

An analysis of variance procedure was applied to this scale and results indicated that significant differences existed amongst all three schools. The F-value was 7.58 with $Pr > 0.0006$. A quick analysis of the survey findings seems to indicate that JH students experience a broader range of interactive pedagogical strategies (group work, discussion, presentations, etc.,) when compared to the perceptions provided by students from the other two schools. Again, student discussion facilitated placement of this issue into a context. The majority of student comments could be classified into three distinctive categories. Firstly, there was recognition of the teacher role and the use of varied instructional strategies:

> I get bored in long classes because teachers do not adjust to the system properly.
>
> 2.5 hours is great if used appropriately, if teachers adjust, once this all settles out it will all be great.

(on changes in activity) ...pretty important because in society today, people have short attention spans, as seen in television etc., so avoid people drifting away.

Teachers need to change their basic teaching style. They always ask us, so I've thought about that. Probably more group work, less textbook work.

Secondly, it became apparent that students placed substantial value upon group work and interaction. A majority of those students interviewed specifically addressed such strategies:

There has to be much more group work, With the 2.5 hours, they can't have you just sitting in your seats.

...group work is important in the improvement of academic achievement.

...change of pace is important, don't get bored as fast. Group work is good, before I hated it now I like it. Don't realize how much it helps you.

I think the group work really helps, helps you remember because it is not just the teacher telling you.

...if the 2.5 hour class is teacher in front of the class, reading, dictating, all you can do is try to absorb the information and squeeze it out on a test, but you don't really learn anything. If the teacher makes you participate so you can have fun while you are learning it is a lot better than just writing down notes.

Thirdly, some students revealed the impression that the use of particularly innovative teaching/learning strategies may be constrained by the context of a subject:

...mostly it depends on the subject, in humanities we did a lot of different things, videos, charts and stuff, but in math the teacher tells us to do the work and we do it and its not very interesting.

Teachers must make it exciting, bearable I guess...for example, math is a bad course for 2.5 hours because you totally lose your train of thought and you just want to be out of there.

One would certainly anticipate possible debate on the latter expressions, and one student did try to put the entire issue into perspective by saying that it "really depended on teachers too, for those who know how to use it (2.5 hours) to their advantage really worked well." These student expressions cannot be considered 'new findings', but they reinforce what researchers have already discovered. Interactive, participatory, activities are crucial steps towards achieving student engagement. Newmann (1991) outlines some important considerations regarding the effective engagement of students:

> ...more time will be needed for teachers to communicate with individual students through sustained talk and writing and for students to talk with one another. Substantive conversation also entails major shifts in the roles of teachers and students. Teachers will function more as mentors and coaches, less as depositories of static knowledge to be reproduced. Students will function more as constructors and producers of knowledge. (Newmann, 1991, as cited in Conley, 1993, p. 86)

Such a perspective parallels the philosophical directions espoused by the Ministry of Education via the new Guidelines for the Kindergarten to Grade 12 Education Plan.

Comfort Level. The educational setting, in particular the atmosphere and environment, has been described as being instrumental in facilitating student engagement. The hypothesis would be that the more comfortable students feel, the more likely they are to engage in discussion, participation and learning. Several questionnaire items were constructed to allow exploration of this issue. This scale has been referred to as 'comfort level' and focused upon the comfort level of students and their willingness to express viewpoints and opinions. The specific questions that comprise the scale are:

3. My teachers know me personally.
8. I feel uncomfortable participating in class discussions.
13. I get together with my peers outside of class to work on school projects.
14. I feel comfortable expressing my views concerns, questions in class.
45. In my classes, we work in small groups.
46. In my classes, students give presentations.

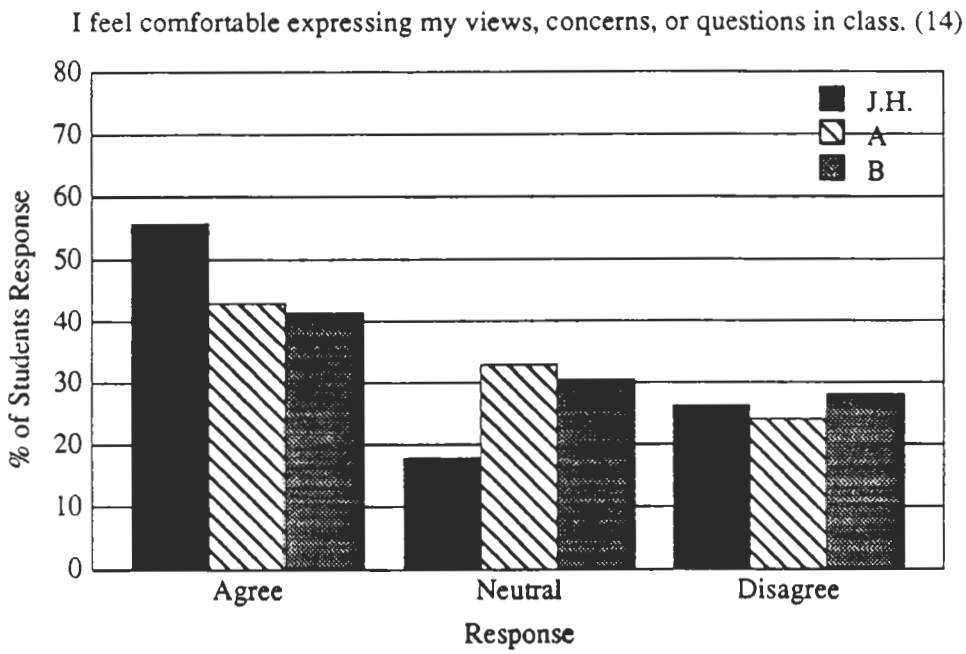
The analysis of variance procedure revealed a significant statistical difference between JH and the other two high schools with the F-value being 10.09 and Pr > F 0.0001. Figure 10 graphically portrays student responses to question 14 (I feel comfortable expressing my views, concerns or questions in class). Although an analysis of variance procedure did not determine significant differences on this particular question among the three schools on this question, a trend that recurs on other questions and in the interviews is evident. Response analysis of this question finds a low percentage of JH students opting to select the neutral response! Only 17.89% of JH students selected the neutral response while school A and school B both had over 30% of respondents select the neutral category. Of the 57 survey questions that were common to all three schools, 27 show JH student responses in the neutral category as being less than both school A and school B.

Student comments and discussion would seem to indicate that the type of teaching methodologies that are required/desirable within the structure of this Copernican Model timetable generally enhance student comfort levels and thus promote participation and interaction. The macroclass seems to solicit opportunities to provide an environment conducive to higher student comfort levels. There would appear to be several variables contributing to establishing these higher student comfort levels. Student perspectives can once again facilitate an understanding of the dynamics involved:

I've noticed that I'm closer to my classmates this year than previous. That could be just teachers teaching methods also.

Teachers give you opportunity to speak out, they don't put you down, actually listen to what you say, may not agree, but listen as long as you are expressing it properly. Teachers do things to get students to know each other in class.

Figure 10



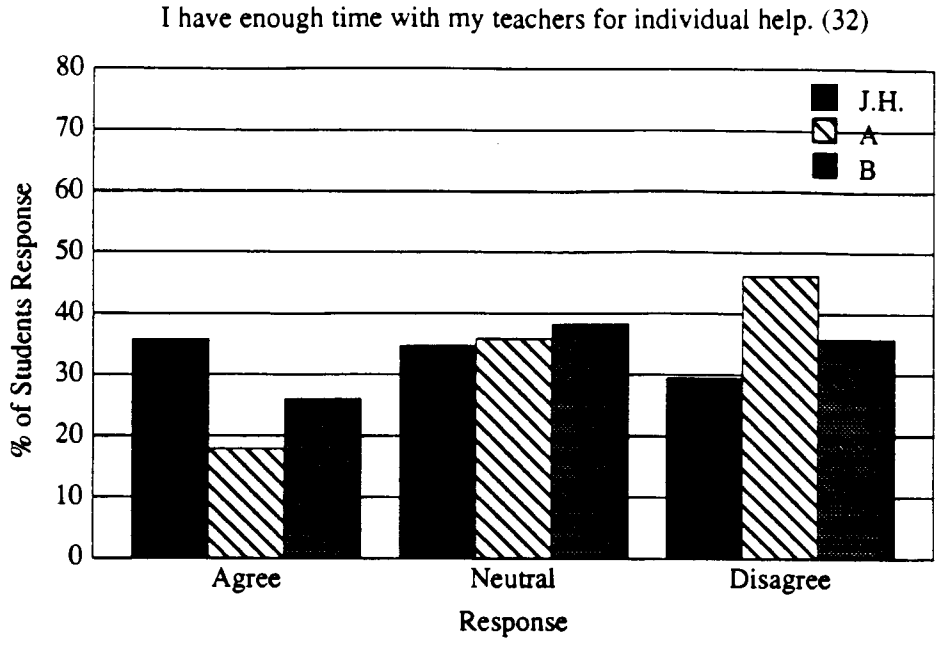
Several students recognized the importance and role that instructional methodologies can play in creating the necessary comfort level in a classroom. Students were also inclined to attribute higher comfort levels to the fact that a considerable amount of time was spent with a limited number of peers and teachers:

> ...you are with them (classmates) the whole time and you get comfortable with them. In the old system, in one hour you are just there, you don't get to know people...you don't really make more friends in this system, you just get more comfortable with them.

> ...in a way it becomes a small little family or a small little group. If you have a problem with the group, that is where it gets more difficult. There are both sides to this question. There is so much time for you to talk to everybody and get to know them. It is almost like they are getting to be like your friends because you are with them so much.
>
> ...fact that only have two classes to worry about, have sort of bonding thing happening faster, class sort of becomes a big group, you're not really afraid to say anything, your class is like all your friends, you have enough time for that.

Survey question number 32 (I have enough time with my teachers for individual help) sought to support the hypothesis that sufficient amounts of individual help time available to a student would support higher student comfort levels. One could assume that a macroclass would afford such opportunities to a greater extent than would traditional class lengths. Figure 11 provides a breakdown of the student responses to question number 32. The analysis of variance procedure yielded an F-value of 4.56 and Pr > 0.0114. The differences between JH and school A were significant, however, the statistical differences between JH and school B were not shown as being significant. Differences between school A and school B were also not significant. One student acknowledged a relationship between the macroclass and higher comfort levels but did express concern as well: "By the time you get used to your class and teacher, it's time to go to another course." Four times a year, students would be expected to become familiar with different expectations and procedures within classes and re-establish a component of their comfort level. Other students still felt this scenario to be preferable to seeing eight different classroom environments over a two day period.

Figure 11



Attitudes, Outlooks and Values. We began this chapter through discussion of the 'big picture' of schooling and it is somewhat fitting to return to this question as we conclude the chapter. The importance of student attitudes towards school and levels of interest in schooling, necessitate close examination of program delivery models. Thus a nine question scale, reflecting student feelings and values about school, was created. Questions included:

10. I enjoy my teachers' lessons for class.
17. I enjoy doing my homework.
19. I am satisfied with the amount of schoolwork that I am completing.
21. I feel challenged by my schoolwork.
22. I enjoy school.
24. I feel that regular school attendance is extremely important.
43. I feel that what I am learning in school is or will someday be useful.
50. I come to class unprepared and without the materials I need.
51. I make good use of class time.

An analysis of variance procedure on this scale provided an F-value of 5.88 and Pr > F 0.0032. The difference of means between JH and the other two schools

were significant. Schools A and B did not have significantly different means for this scale of questions. These results have substantial implications. Although the number of variables impacting upon the range of issues represented by this particular scale are considerable, school organization and scheduling are certain to be major factors amongst this group of variables. The questions comprising this scale target student feelings and attitudes that capture the essence of ability to engage in learning.

In summary, the student survey provided for useful comparative analysis of student perspectives amongst the three schools. These perspectives generated further areas of exploration for the interview component of data collection at JH. Subsequent analysis of data yielded by both quantitative and qualitative instruments revealed findings that are largely congruent. Students were able to articulate perspectives on several key issues associated with the Copernican Model timetable and, in so doing, supported some of the findings associated with other studies of similar timetables (Masconomet, L.V. Rogers). Most of these findings can be described as having a positive orientation. Chapter five will summarize the research findings and discuss the associated implications.

CHAPTER FIVE: CONCLUSIONS

The conclusion of this study is comprised of four sections. The first section provides an analysis of the larger context of scheduling challenges. This is followed by a summary of the research findings and a discussion of their implications. Section three identifies some limitations of the study. The chapter concludes with recommendations for future research directions.

A Holistic Perspective

Scheduling could indeed be viewed as a labyrinth, one which has most certainly become more complex as the latter part of this century has evolved. The scheduling maze abounds with conflicting philosophies and dynamic tensions while at the same time offering exciting exploratory opportunities. It is such an interpretation which could prompt one to identify scheduling as a primary locus of scholarship in education. Signs of vitality and vigor in scheduling research reflect the myriad of pressures being exerted upon the educational system. While the demands placed on education have increased, financial support, enrollments, morale and public image have declined. The revolution accompanying this reality is as much a reason for hope as for despair. Indeed, Charles Dickens' characterization of an earlier European revolutionary period might well be applied to our educational atmosphere, "It was the best of times, it was the worst of times" (Dickens, 1992, p. 11). Educators are responding to the challenges through a scrutiny of the role and process of education, thereby shaping the framework for a new paradigm of teaching and learning. Scheduling practices are being recognized as playing a critical role in the evolution of this process.

Educators are increasingly willing to shift from adaptive scheduling changes towards 'restructured' practices in an effort to best meet the needs of their students. Such fundamental changes can frequently leave opportunities for criticism and conjecture. Joseph Carroll has certainly fielded such criticism. Debate however, should not focus upon claims of heresy or revolution, but on the philosophy, objectives and eventually, the outcomes associated with a particular scheduling model. At the center of such considerations we would expect to find the student. Thus, this study has endeavored to bring a level of understanding to, and interpretations of, student perspectives associated with the Copernican Model timetable at Johnston Heights Secondary (JH).

Summary of Research Findings

The results of this study do not conclusively prove that all levels of satisfaction and success demonstrated by JH students can primarily be related to the Copernican Model timetable. The wide range of potential variables encountered by this broad study preclude such all-inclusive associations. Rather, there are many significant findings and corroborative data to suggest that this study attributes the positive and successful experiences of many students to the Copernican Model timetable. Let us examine some of the key findings.

Student Achievement. In the area of student achievement, 50% of the JH survey students indicated they felt that they had improved academically. This appears to be verified by a notable increase of students on the honor roll (from 20-25% to 36.5%). Seven of the ten Grade 12 Provincial Exam results for 1993-94 were higher than district and provincial averages, even though JH has just

recently added grade 12. Factors associated with achievement, such as attendance, have also shown documented improvement.

Flex Activities. Survey and interview respondents were critical of flex time activities as they were structured. Many students were unable to identify specific goals of flex time and could not cite examples of personal participation in the program. Several students indicated that flex time expectations were clearly an infringement upon their lunch time! Other students did acknowledge the potential attributes of flex time activities, but suggested that greater levels of accountability were necessary to make these activities meaningful.

Ability to Stay Organized. JH student responses to interview questions clearly indicated a strong association with improved organizational abilities and only having to take two classes at a time under the Copernican Model timetable. The survey questions substantiated this perception. Question number 35 stated, "Our school timetable makes it easier to stay organized." A significant difference was noted between JH and both schools A and B. Many JH students attributed their improved academic performance with the fact that they only had to focus on two courses at any point in time.

Retention. Some of the student interview respondents did express a concern with this issue, but were able to articulate a range of coping strategies to offset these concerns. Three survey questions on retention matters were grouped as a scale and subjected to analysis of variance procedures. There was no significant difference in the means representing student responses from the three schools. This can be interpreted as a positive signal for JH students.

Suitability of Timetable for Courses. Several students did express a concern over the suitability of the current Copernican configuration for courses such as Math and the Senior Sciences. Some felt that it was difficult to digest curricular material at the pace they "had to cover". Student suggestions included differential time allocations to some of these courses. Mark distributions and provincial examination results do not indicate student achievement difficulties in the aforementioned courses. This, however, is an area that warrants much further study.

Pace and Pressure. Almost one third of JH students completing the written extended response questions indicated that pace/pressure was a difficulty for them. However, an analysis of variance on a scale of seven questions related to pace/pressure indicated no significant differences among the three schools. This result must be considered positive for JH students. Recent requirements for adapting to change and the need to develop some different strategies, might account for the willingness of some students to articulate concerns about pace and pressure during the interviews.

Instructional Strategies. Both quantitative and qualitative analysis indicate that JH students experience a broader range of instructional strategies than those encountered by students at schools A and B. Eight survey items related to teaching/learning methodologies were incorporated as a scale and subjected to an analysis of variance procedure. A significant difference existed between JH and the other two schools. Student interviews revealed that substantial value was placed upon opportunities to participate in group work and to interact with the teacher. Students indicated that this has been a notable change associated with the Copernican system.

Student Comfort Level. Students at JH appeared to be more comfortable in participating in class discussions and rendering opinions. The students attributed this fact to the extended opportunities they have to engage in group work and to the extended period of time that they are in contact with the same group of students. One student described it as "sort of like a family". Six survey items were grouped to represent a scale entitled 'comfort'. The analysis of variance procedure showed a significant statistical difference between JH and the other two schools.

Attitudes, Outlooks and Values towards School. The effective schooling literature indicates that student attitude and outlook towards school is a key factor in terms of student willingness to engage in learning. The survey sought to gauge student attitudes, satisfaction and values as they are associated with school. Nine questions (such as 'I enjoy school') were incorporated into a scale and subjected to an analysis of variance procedure. The difference of means between JH and the other two schools were significant. JH students expressed high levels of satisfaction with the amount of school work that they were completing and frequently recognized subjects covered in classes as interesting.

The Copernican Model timetable employed at Johnston Heights Secondary contributes to a school environment which has improved academic performance levels of students. Even more significantly, the characteristics associated with this timetable have enhanced student organizational abilities, increased the range of instructional strategies experienced by students and provided levels of student comfort that encourage classroom participation and

involvement. Students at JH were quick to identify specific characteristics associated with the timetable as being highly desirable. Students placed much value on extended opportunities to interact with other students and teachers. Such methodologies were credited with forming increased comfort levels. Many issues related to the schedule were raised including retention and course pressure. Student perspectives in these areas did not vary greatly from those being expressed by students at the other two schools. Students were, however, critical of the expectations associated with flex time activities and were willing to make suggestions for improvements in this area. Overall, the Copernican Model timetable at JH appears to foster important student attitudes and values towards school. Compared to student survey responses from schools A and B, JH students indicated higher levels of satisfaction and interest in schoolwork. Such attitudes and values can only help to promote desired learning engagement.

Limitations

This investigation can be considered a quasi-experimental study, and as such will encounter many variables, some of which will be unanticipated. Extraneous variables can take several forms, as demonstrated by the following examples:

1). The relative weakness or lack of depth in the literature available on the topic.

2). Many variables could not be taken into consideration because of the broad approach of the study. The teacher, change itself or the facility have not been taken into account in terms of the analysis that has been undertaken.

3). School socio/cultural components will undergo some periodic variations that are difficult to evaluate.

4). The Hawthorne Effect can create an unanticipated impact on schools that have recently experienced substantial changes. Two of the schools in this study have endured such changes.

5). Limited availability of baseline data extending over a period of time makes historical analysis difficult.

6). Direct comparison of data with other schools is very difficult, especially in light of earlier discussion on the 'deep structure' of schools.

Future Directions for Research

Substantive study and investigation of the Copernican timetable is certainly warranted and required. It will be necessary to further investigate the possible reasons for some of the observed significant differences between JH student responses and those of schools A and B. The identification of critical factors or variables associated with the described student perspectives could facilitate enhanced learning opportunities. Possible areas of further study include, but are not limited to:

1). Retention rates: quantitative assessment of student retention over an extended period of time.

2). Distribution of letter grades: a comparative analysis of letter grade distributions between the different timetable models. Also a comparative examination of marks distributions for each subject area.

3). Comparative analysis with other timetables: this study endeavored to compare student perspectives between Copernican and modified linear timetables. Such analysis could be extended to include other timetable variations.

4). Qualitative investigation: a truly ethnographic study would yield interesting 'cultural' data on students, staff, etc.

5). Duration of classes: is there an ideal length for a macroclass or could, as a student suggested, we have a class with 1.25 hours twice in the same day, thus retaining the value of only having two classes at a time.

6). Suitability of timetable for a specific discipline: research on the time frame over which a course in a particular subject area is completed (10 weeks, 20 weeks, etc.). Does pace preclude or restrict the use of certain instructional methodologies which have been proven to be successful? Under this model, do some courses require additional time considerations? (Math, Biology, Band, Languages, etc.)

7). Teacher - student relationship: how is this relationship altered by a Copernican Model timetable?

8). Course sequencing: what impact does this have on student achievement levels?

9). Long term research: to determine the possible impact of the Hawthorne Effect and consistency of Copernican results.

10). 'Copernican Factor': further research to broaden this formula and incorporate meaningful elements of instructional pedagogy.

11) Student engagement: analysis on the extent/degree of student engagement with a Copernican Model timetable.

12). Extra-curricular impact: how does a Copernican timetable effect extra-curricular areas (school spirit within a school could also be examined).

13) Perceived student/teacher pressures: what type of pressures are experienced and are they associated with the initial implementation of such a timetable or do these pressures persist over time.

14). Instructional Strategies: how does the Copernican timetable impact upon a teacher and their repertoire of instructional strategies? What methodologies become commonly used?

15). Student attitude/outlook: what impacts can be attributed to features of a Copernican Model timetable? Are there higher levels of student satisfaction.

Further investigation and research into the Copernican Model timetables will ensure important evolutionary steps in the development of this viable organizational structure. This process will certainly reflect school and community needs, thereby enabling learners to further develop their potential.

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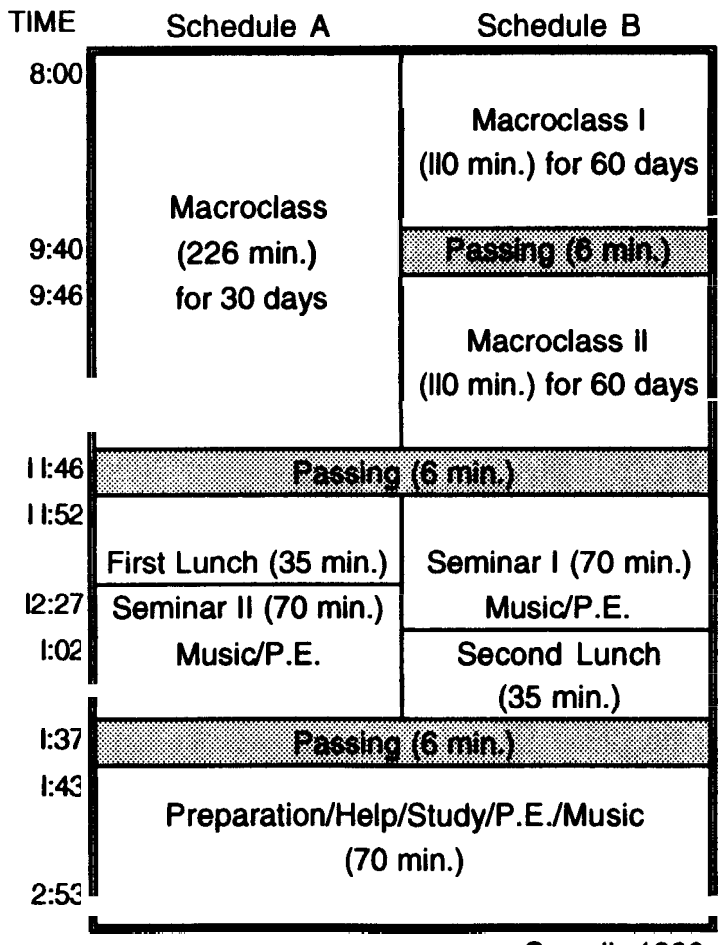
APPENDICES

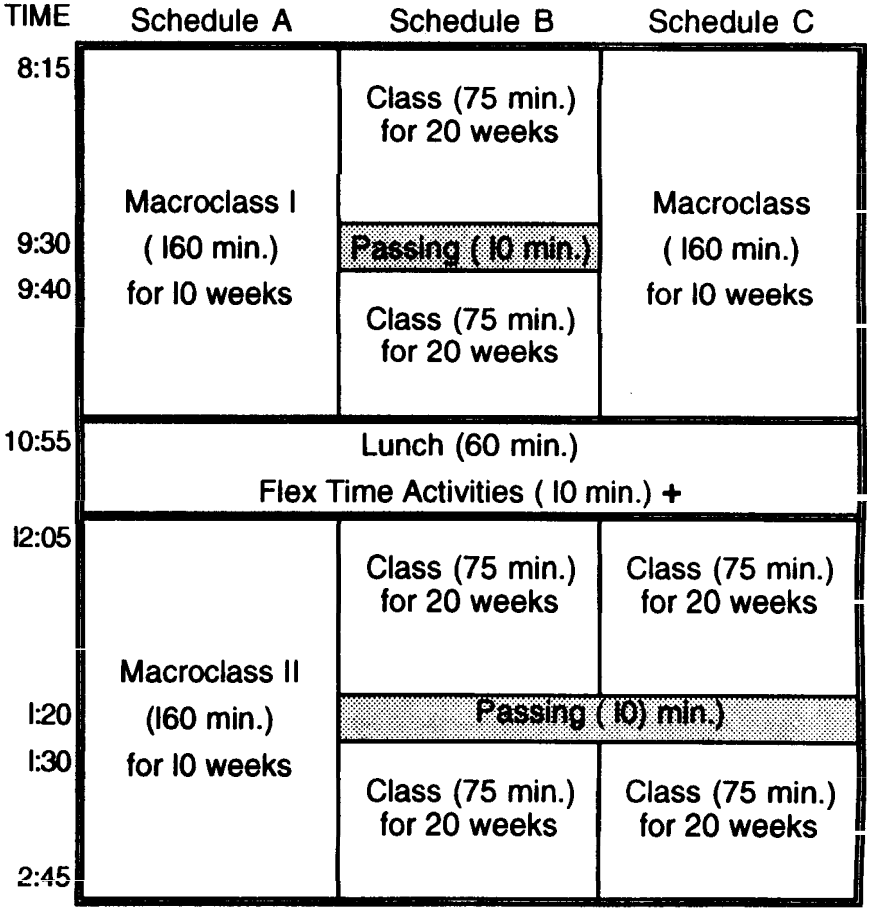
COPERNICAN MODEL SCHEDULE CONFIGURATIONS

TWO SCHEDULES PROPOSED BY CARROLL



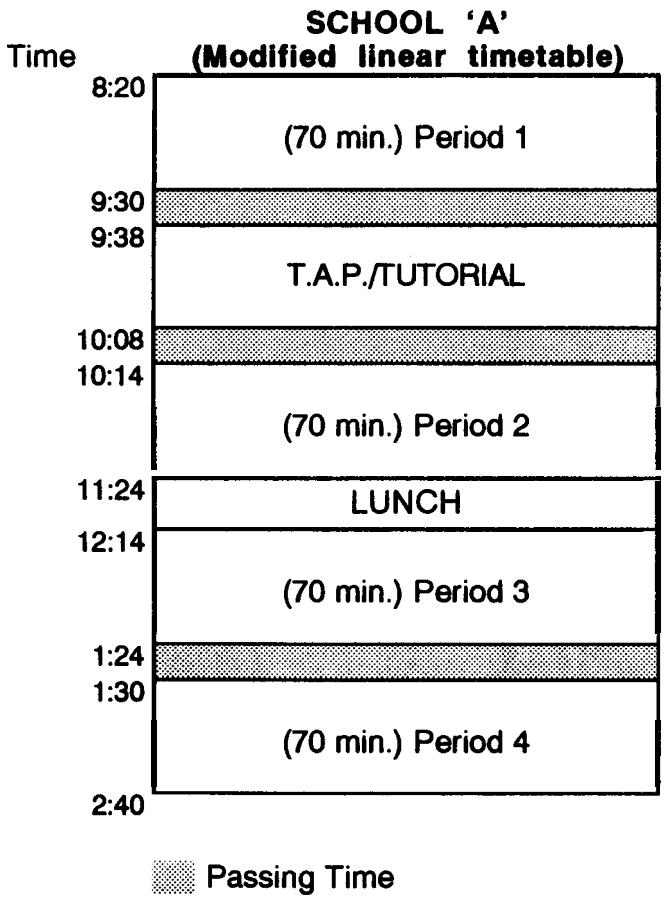
Carroll, 1990

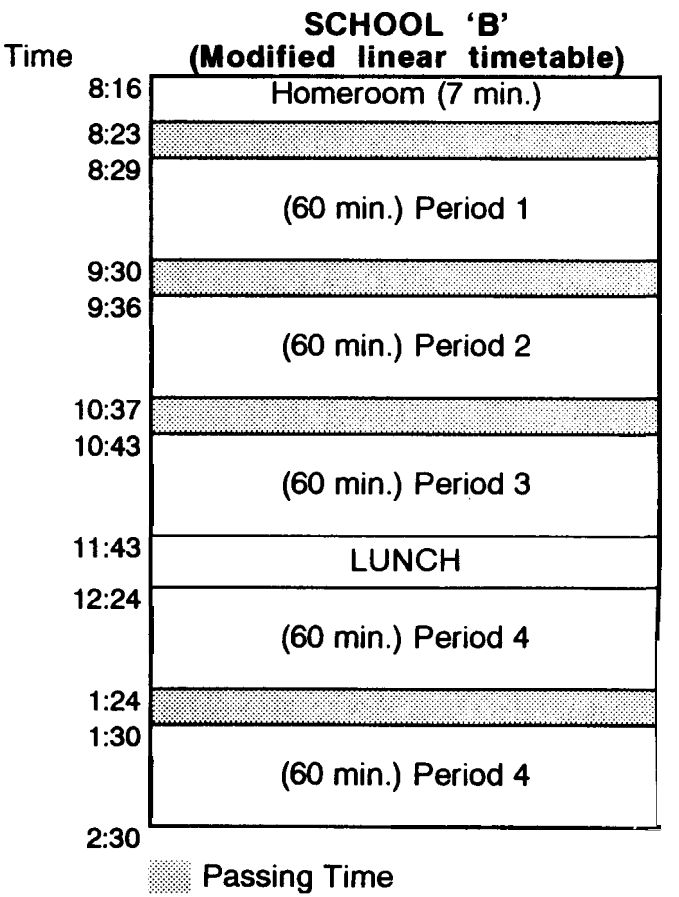
JOHNSTON HEIGHTS SCHEDULE



\+ These time allocations are variable depending on activities

TIMETABLE CONFIGURATIONS FOR SCHOOLS 'A' AND 'B'





SCANTRON

36 SURREY

What grade are you in? _____ What gender are you? _____

Do you eventually plan to continue with a post-secondary education? ☐ Yes ☐ No

What does you current program include? Check those that apply.

☐ Academic ☐ Advanced Placement

☐ E.S.L. ☐ French Immersion

☐ Career Preparation ☐ C.E.L.D.

☐ B.A.S.E.S. ☐ Other

INSTRUCTIONS

USE PENCIL OR PEN. DO NOT USE RED INK.
FILL IN BOX COMPLETELY. ■
IF YOU WISH TO CHANGE YOUR ANSWER, ERASE THE WRONG MARK.

Strongly Disagree
Disagree
Neutral
Agree
Strongly Agree

1.	I can talk to my teachers concerning my schoolwork.				
2.	I can talk to my teachers about things not related to my schoolwork.				
3.	My teachers know me personally.				
4.	My teachers regularly provide information about my progress and grades.				
5.	I regularly talk to my parents/guardians about school.				
6.	My parents/guardians are comfortable making contact with my teachers.				
7.	My teachers use different types of instruction to help me learn. (i.e. group work, lecture, projects, videos, etc.)				
8.	I feel uncomfortable participating in class discussions.				
9.	My teachers use materials taken from sources other than the textbook.				
10.	I enjoy my teachers' lessons for class.				
11.	My teachers assign independent projects (reports, library research, etc.).				
12.	I seldom get together with my classmates outside of school.				
13.	I get together with my peers outside of class to work on school projects.				
14.	I feel comfortable expressing my views, concerns, or questions in class.				
15.	I discuss classroom topics with my friends outside of regular class time.				
16.	I find it easy to make time for extra-curricular activities (sports, bands, clubs, etc.).				
17.	I enjoy doing my homework.				
18.	I receive a consistent amount of homework every day. (As opposed to having none on one day, but a considerable amount the next day).				
19.	I am satisfied with the amount of school work that I am completing.				
20.	I feel confused and stressed about school.				

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	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
21. I feel challenged by my schoolwork.					
22. I enjoy school.					
23. The subjects covered in my classes are interesting.					
24. I feel that regular school attendance is extremely important.					
25. Class scheduling has been a problem for me this year.					
26. My current class schedule is suitable.					
27. My class periods are an appropriate length.					
28. I am able to remember the material presented in class.					
29. I am able to remember the material presented in a course.					
30. The pace (speed and demands) of most courses is appropriate.					
31. I have enough chances to take part in field trips.					
32. I have enough time with my teachers for individual help.					
33. My daily schedule provides for enough extra-help time with teachers.					
34. I like our school timetable. (Semester, non-semester, length of classes, number of classes/day)					
35. Our school timetable makes it easy to stay organized.					
36. There is enough time to catch up on missed work due to absences.					
37. Our timetable makes it easy to study for tests.					
38. Our timetable is well accepted by other students.					
39. Our timetable is well accepted by school staff.					
40. Our timetable is well accepted by parents.					
41. Our timetable provides for a positive school spirit.					
42. Too much material is covered in class every day.					
43. I feel that what I am learning in school is or will someday be useful.					
44. My grades have been dropping.					

COMMENTS:

SURREY

INSTRUCTIONS

USE PENCIL OR PEN. DO NOT USE RED INK.
FILL IN BOX COMPLETELY.
IF YOU WISH TO CHANGE YOUR ANSWER, ERASE THE WRONG MARK.

Never
Seldom
Sometimes
Often
Always

45. In my classes, we work in small groups.
46. In my classes, students give presentations.
47. In my classes, we have discussions.
48. Information presented in class comes from teacher lectures.
49. I receive class time in which to do homework.
50. I come to class unprepared and without the materials I need.
51. I make good use of class time.
52. I understand the material being taught in class.
53. My teachers present lessons together.
54. Students are disruptive in my classes.

••• PLEASE CIRCLE THE APPROPRIATE RESPONSE •••

55. How many hours every week do you spend on extracurricular activities (sport teams, clubs, music)? If you are not involved in any, please leave this question blank.

A) 1–3 hrs B) 3–6 hrs C) 6–9 hrs D) 9–12 hrs E) More than 12 hrs

56. How much time do you spend on homework every day?

A) 0–30 mins B) 31–60 mins C) 1–2 hrs D) 2–3 hrs E) More than 3 hrs

57. How much time do you spend every day studying something which was not specifically assigned as homework?

A) 0–30 mins B) 31–60 mins C) 1–2 hrs D) 2–3 hrs E) More than 3 hrs

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
58. Two and one–half hour classes every day are too long.					
59. I like completing some of my courses (including final exams) at the end of each quarter rather than completing all eight courses in June.					
60. I make use of tutorials and other activities offered at lunch.					
61. The school is designed to make me the most important part of the whole system.					
62. I have a tough time staying on task during a two and one–half hour class.					
63. I have been more academically successful in my courses on the "Quarter System Timetable".					
64. I am able to stay focussed and keep my attention fixed during class.					
65. I enjoy the absence of bells and the flexibility it offers teachers.					
66. Flex–time activities meet their goals and are useful.					
67. The material comes too fast and there is too much homework in this school.					

COMMENTS:

68. Some strengths of our school timetable are:

69. An important change that would make the school timetable better is:

70. The greatest difficulty that our current timetable presents for me is:

71. Please list any subjects that you feel do not work well with the way the school timetable is set up.

72. Please feel free to make any additional comments about your school timetable.

Summary of Survey Results for all Respondents, by School

1) All numbers are expressed in percent, rounded to two decimal places

2) Student responses to the five point scale have been grouped such that positive, neutral, and negative responses can be easily discerned. (S.A. = strongly agree, A. = agree, N. = neutral, D. = disagree, S. D. = strongly disagree)

3) Number of survey responses from each school: J.H. = 98, A = 79, B = 83

		S.A./A.	N.	D./S. D.
1. I can talk to my teachers concerning my schoolwork.	J. H.	70.21	24.27	05.32
	A	73.42	22.78	03.80
	B	75.61	18.29	06.10
2. I can talk to my teachers about things not related to my schoolwork.	J. H.	23.60	38.30	35.11
	A	21.52	37.97	40.50
	B	35.37	31.71	32.93
3. My teachers know me personally.	J. H.	27.66	29.79	42.55
	A	16.46	43.04	40.51
	B	25.61	37.80	36.58
4. My teachers regularly provide information about my progress and grades.	J. H.	66.31	20.00	13.68
	A	41.77	35.44	22.79
	B	56.79	28.40	14.81
5. I regularly talk to my parents/guardians about school.	J. H.	48.38	27.96	23.65
	A	44.30	27.85	27.85
	B	46.34	32.93	20.74
6. My parents/guardians are comfortable making contact with my teachers.	J. H.	40.09	38.95	21.06
	A	36.71	29.11	34.17
	B	35.80	35.80	28.40
7. My teachers use various different types of instruction to help me learn. (i.e.) group work, lecture, projects, videos, etc.	J. H.	76.84	17.89	05.27
	A	64.55	20.25	15.18
	B	56.10	30.49	13.42
8. I feel uncomfortable participating in class discussions.	J. H.	15.95	22.35	61.70
	A	25.32	22.78	51.89
	B	23.17	21.95	54.88

		S.A./A.	N.	D./S. D.
9. My teachers use materials taken from sources other than the textbook.	J. H.	69.15	19.15	11.70
	A	56.96	36.71	06.33
	B	57.32	34.15	08.54
10. I enjoy my teachers' lessons for class.	J. H.	36.84	48.42	14.74
	A	27.85	43.04	29.11
	B	43.91	37.81	18.29
11. My teachers assign independent projects.	J. H.	70.52	22.11	07.37
	A	83.54	12.66	03.80
	B	70.37	17.28	12.35
12. My teachers regularly provide information about my progress and grades.	J. H.	26.09	21.73	52.18
	A	18.99	29.11	51.89
	B	28.05	20.73	51.22
13. I get together with my peers outside of class to work on school projects.	J. H.	36.84	30.63	30.52
	A	30.38	37.97	31.64
	B	29.27	25.61	45.12
14. I feel comfortable expressing my views, concerns, questions in class.	J. H.	55.70	17.89	26.31
	A	43.04	32.91	24.05
	B	41.46	30.49	28.05
15. I discuss classroom topics with my friends outside of regular class time.	J. H.	43.16	29.47	27.37
	A	30.38	36.71	32.91
	B	40.25	30.49	29.26
16. I find it easy to make time for extra-curricularactivities. (sports, bands, clubs, etc.)	J. H.	40.00	25.26	34.74
	A	37.98	25.32	36.71
	B	50.00	19.51	30.49
17. I enjoy doing my homework.	J. H.	09.48	42.11	48.43
	A	06.33	34.18	59.49
	B	09.76	34.15	56.10
18. I receive a consistent amount of homework every day. (as opposed to having none onone day, but a considerable amount the next day)	J. H.	46.32	24.21	29.47
	A	40.51	34.18	25.32
	B	46.92	22.22	30.86
19. I am satisfied with the amount of schoolwork that I am completing.	J. H.	64.21	23.16	12.63
	A	37.66	35.06	25.32
	B	51.85	28.40	19.75
20. I feel confused and stressed about school.	J. H.	35.79	30.53	33.68
	A	43.03	26.58	30.38
	B	39.02	25.61	35.37

		S.A./A.	N.	D./S. D.
21. I feel challenged by my schoolwork.	J. H.	56.84	37.74	08.42
	A	53.83	26.92	19.23
	B	46.35	35.37	18.29
22. I enjoy school.	J. H.	42.11	40.00	17.89
	A	34.61	33.33	32.05
	B	31.71	40.24	28.04
23. The subjects covered in my classes are interesting.	J. H.	42.10	41.05	16.84
	A	23.07	51.28	25.64
	B	26.83	48.78	24.39
24. I feel that regular school attendance is extremely important.	J. H.	75.79	12.63	11.58
	A	69.23	20.51	10.26
	B	64.20	23.46	12.34
25. Class scheduling has been a problem for me this year.	J. H.	25.26	17.89	56.84
	A	29.49	28.21	42.30
	B	12.35	24.69	62.97
26. My current class schedule is suitable.	J. H.	70.52	17.80	11.58
	A	55.13	32.05	12.82
	B	71.95	20.73	07.32
27. My class periods are an appropriate length.	J. H.	41.06	29.47	29.47
	A	38.46	25.64	35.90
	B	61.25	22.50	16.25
28. I am able to remember the material presented in class.	J. H.	58.51	31.91	09.58
	A	39.75	41.03	19.23
	B	51.85	29.63	18.51
29. I am able to remember the material presented in a course.	J. H.	43.16	42.11	14.74
	A	37.18	41.03	21.79
	B	37.04	43.21	19.75
30. The pace (speed and demands) of most courses is appropriate.	J. H.	36.17	31.91	31.91
	A	38.47	37.18	24.36
	B	54.32	23.46	22.22
31. I have enough chances to participate in field trips.	J. H.	23.16	23.16	53.69
	A	20.51	17.95	61.54
	B	22.50	17.50	60.00
32. I have enough time with my teachers for individual help.	J. H.	35.79	34.74	29.47
	A	17.94	35.90	46.15
	B	25.92	38.27	35.81
33. My daily schedule provides for enough extra help time with teachers.	J. H.	27.37	39.89	37.74
	A	30.76	25.64	33.59
	B	28.40	28.40	43.21

		S.A./A.	N.	D./S. D.
34. I like our school timetable. (semester, non-semester, length of classes, number of classes/day)	J. H.	55.32	18.09	26.59
	A	46.15	21.79	32.05
	B	46.92	22.22	30.86
35. Our school timetable makes it easier to stay organized.	J. H.	67.37	11.58	21.05
	A	39.74	37.18	23.07
	B	44.45	23.46	32.10
36. There is enough time to catch up on missed work due to absences.	J. H.	21.06	17.89	61.05
	A	37.18	21.79	41.02
	B	43.21	24.69	32.10
37. Our timetable makes it easy to study for tests.	J. H.	49.47	21.06	29.47
	A	51.28	21.79	26.92
	B	40.25	29.27	30.48
38. Our timetable is well accepted by other students.	J. H.	28.73	43.62	27.66
	A	35.89	39.74	24.36
	B	31.71	45.12	23.17
39. Our timetable is well accepted by school staff.	J. H.	35.79	48.42	15.79
	A	42.86	41.56	15.55
	B	47.57	47.56	04.88
40. Our timetable is well accepted by parents.	J. H.	35.79	40.00	24.21
	A	35.89	55.13	08.98
	B	29.27	60.98	09.76
41. Our timetable provides for a positive school spirit.	J. H.	26.31	47.37	26.32
	A	26.92	46.15	26.93
	B	17.28	55.56	27.16
42. Too much material is covered in class every day.	J. H.	43.48	31.52	25.00
	A	35.89	41.03	23.08
	B	35.37	35.37	29.27
43. I feel that what I am learning in school is or will someday be useful.	J. H.	56.84	25.26	17.89
	A	50.58	24.68	24.68
	B	43.90	25.61	30.49
44. My grades have been dropping.	J. H.	24.17	23.08	52.74
	A	31.95	27.78	40.27
	B	32.90	28.95	38.15

NOTE: For statements 45 - 54, the following categories apply:
A. = always, O. = often, S. = sometimes, Se. = seldom, N. = never

		A./O.	S.	Se./N.
45. In my classes, we work in small groups.	J. H.	52.74	43.96	03.30
	A	24.05	50.63	25.32
	B	21.95	59.76	18.29
46. In my classes, students give presentations.	J. H.	58.24	25.27	16.49
	A	17.72	54.43	27.84
	B	17.07	46.34	35.59
47. In my classes, we have discussions.	J. H.	67.78	18.89	13.34
	A	68.35	27.85	03.90
	B	65.44	25.93	08.64
48. Information presented in class comes from teacher lectures.	J. H.	30.76	49.46	19.78
	A	66.66	25.64	07.69
	B	35.37	46.34	18.29
49. I receive class time in which to do homework.	J. H.	28.57	32.97	28.46
	A	17.73	36.71	45.57
	B	34.15	41.46	24.39
50. I come to class unprepared and without the materials I need.	J. H.	07.78	13.33	78.88
	A	03.70	18.99	77.22
	B	09.76	18.29	71.95
51. I make good use of class time.	J. H.	69.23	27.47	03.30
	A	57.69	35.90	06.41
	B	61.73	29.63	08.64
52. I understand the material taught in class.	J. H.	78.22	21.11	06.67
	A	63.29	34.18	02.53
	B	58.54	31.71	09.76
53. My teachers present lessons together.	J. H.	17.24	37.93	44.83
	A	21.79	24.36	53.85
	B	17.50	32.50	50.00
54. Students are disruptive in my classes.	J. H.	28.89	46.67	24.44
	A	29.87	51.95	18.18
	B	43.75	48.75	07.50

		1-3 hours	3-6 hours	6-9 hours	9-12 hours	>12 hours
55. How many hours every week do you spend on extra-curricular activities (sport teams, clubs, music)? If you are not in any, leave this question blank.	J. H.	27.42	19.35	19.35	09.68	24.19
	A	26.32	28.07	19.30	12.28	14.04
	B	30.51	16.95	16.95	20.34	15.25
		0-30 minutes	31-60 minutes	1-2 hours	2-3 hours	>3 hours
56. How much time do you spend on homework every day?	J. H.	25.58	23.26	30.23	16.28	04.65
	A	13.92	27.85	34.18	16.46	07.59
	B	28.25	22.50	35.00	07.50	06.25
		0-30 minutes	31-60 minutes	1-2 hours	2-3 hours	>3 hours
57. How much time do you spend every day studying something which was not specifically assigned as homework?	J. H.	73.75	17.50	06.25	01.25	01.25
	A	72.15	16.46	08.86	02.53	00.00
	B	77.63	15.79	06.58	00.00	00.00

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The following 10 questions were answered only by Johnston Heights Secondary students

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		S.A./A.	N.	D./S. D.
58. Two and one-half hour classes every day are too long.	J. H.	39.77	35.23	25.00
59. I like completing some of my courses (including final exams) at the end of each quarter rather than completing all eight courses in June.	J. H.	78.16	10.34	11.50
60. I make use of tutorials and other activities offered at lunch.	J. H.	21.59	29.55	48.86
61. The school is designed to make me the most important part of the whole system.	J. H.	23.86	40.91	35.23
62. I have a tough time staying on task during a two and one-half hour class.	J. H.	42.05	29.55	28.41
63. I have been more academically successful in my courses on the "Quarter System Timetable".	J. H.	47.13	31.03	21.83

		S.A./A.	N.	D./S. D.
64. I am able to stay focused and keep my attention fixed during class.	J. H.	41.95	36.36	21.58
65. I enjoy the absense of bells and the flexibility it offers teachers.	J. H.	35.23	43.18	21.59
66. Flex time activities meet their goals and are useful.	J. H.	27.59	26.44	45.98
67. The material comes too fast and there is too much homework in this school.	J. H.	33.33	26.44	40.23

BASIC MEANS FOR ALL RESPONDENTS (Q1-57)

Mean values were calculated for each question (variable) by using a five point scale whereby 2 = Strongly Agree, 1 = Agree, 0 = Neutral, -1 = Disagree, -2 = Strongly Disagree. Represented mean values and standard deviations have been rounded to two decimal places.

Variable	Mean	N	Std Dev
Q1	0.93	259	0.90
Q2	-0.13	259	1.11
Q3	-0.22	259	1.07
Q4	0.46	259	0.99
Q5	0.26	258	1.19
Q6	0.17	259	1.18
Q7	0.77	260	1.04
Q8	0.56	259	1.24
Q9	0.67	259	0.89
Q10	0.17	260	0.97
Q11	0.85	259	0.89
Q12	-0.48	257	1.25
Q13	-0.08	260	1.14
Q14	0.35	260	1.21
Q15	0.05	260	1.10
Q16	0.15	260	1.30
Q17	-0.76	260	1.05
Q18	0.14	259	1.15
Q19	0.39	257	1.06
Q20	-0.17	260	1.28
Q21	0.44	259	0.94
Q22	0.06	259	1.14
Q23	0.09	259	0.89
Q24	0.84	258	1.06
Q25	-0.44	258	1.22
Q26	0.66	259	0.97
Q27	0.18	257	1.17
Q28	0.43	257	0.92
Q29	0.22	258	0.95
Q30	0.11	257	1.07

Variable	Mean	N	Std Dev
Q31	-0.61	257	1.20
Q32	-0.15	258	1.04
Q33	-0.19	258	1.06
Q34	0.18	257	1.36
Q35	0.36	258	1.21
Q36	-0.29	258	1.29
Q37	0.17	259	1.26
Q38	0.02	258	1.03
Q39	0.34	258	0.93
Q40	0.17	259	0.95
Q41	-0.09	258	1.01
Q42	-0.24	256	1.13
Q43	0.38	258	1.22
Q44	-0.24	243	1.31
Q45	0.23	258	0.80
Q46	0.08	258	0.96
Q47	0.80	256	0.97
Q48	0.34	257	0.97
Q49	-0.16	258	1.08
Q50	1.00	257	0.94
Q51	0.69	256	0.82
Q52	0.75	257	0.83
Q53	-0.53	250	1.19
Q54	0.25	252	0.98
Q55	0.24	184	1.48
Q56	0.44	251	1.16
Q57	1.64	241	0.71

MEAN VALUES FOR SURVEY QUESTIONS BY SCHOOL

Mean values were calculated for each question (variable) by using a five point scale whereby 2 = Strongly Agree, 1 = Agree, 0 = Neutral, -1 = Disagree, -2 = Strongly Disagree. Represented mean values have been rounded to two decimal places.

Variable	JH Mean	N	'A' Mean	N	'B' Mean	N
Q1	0.92	97	0.94	79	0.94	82
Q2	-0.15	97	-0.29	79	-0.04	82
Q3	-0.16	97	-0.37	79	-0.16	82
Q4	0.56	98	0.23	79	0.54	81
Q5	0.28	96	0.20	79	0.29	82
Q6	0.32	98	0.06	79	0.09	81
Q7	1.07	98	0.56	79	0.60	82
Q8	0.67	97	0.41	79	0.57	82
Q9	0.76	97	0.59	79	0.61	82
Q10	0.27	98	-0.10	79	0.29	82
Q11	0.82	98	1.08	79	0.69	81
Q12	-0.52	95	-0.53	79	-0.40	82
Q13	0.07	98	-0.09	79	-0.28	82
Q14	0.49	98	0.24	79	0.28	82
Q15	0.16	98	-0.10	79	0.02	82
Q16	0.09	98	0.01	79	0.35	82
Q17	-0.63	98	-0.91	79	-0.76	82
Q18	0.07	98	0.15	79	0.20	81
Q19	0.65	98	0.09	77	0.32	81
Q20	-0.08	98	-0.27	79	-0.17	82
Q21	0.51	98	0.42	78	0.37	82
Q22	0.22	98	-0.08	78	-0.02	82
Q23	0.28	98	-0.05	78	-0.02	82
Q24	0.91	98	0.87	78	0.72	81
Q25	-0.37	98	-0.27	78	-0.69	81
Q26	0.73	98	0.47	78	0.76	82
Q27	0.09	98	-0.01	78	0.45	80
Q28	0.57	97	0.29	78	0.38	81
Q29	0.29	98	0.19	78	0.19	81
Q30	-0.05	97	0.12	78	-0.30	81
Q31	-0.50	98	-0.74	78	-0.65	80
Q32	0.06	98	-0.41	78	-0.16	81
Q33	-0.17	98	-0.15	78	-0.26	81
Q34	0.33	97	0.09	78	0.09	81
Q35	0.67	98	0.21	78	0.12	81
Q36	-0.66	98	-0.09	78	0.00	81
Q37	0.20	98	0.28	78	0.04	82
Q38	-0.04	97	0.10	78	0.01	82

MEAN VALUES FOR SURVEY QUESTIONS (Q39-57)

Variable	JH Mean	N	'A' Mean	N	'B' Mean	N
Q39	0.23	98	0.27	77	0.54	82
Q40	0.03	98	0.31	78	0.20	82
Q41	-0.04	98	-0.04	78	-0.19	81
Q42	-0.34	95	-0.23	78	-0.12	82
Q43	0.56	98	0.31	77	0.23	82
Q44	-0.47	94	-0.13	72	-0.04	76
Q45	0.56	97	0.00	79	0.07	82
Q46	0.51	97	-0.13	79	-0.22	82
Q47	0.88	96	0.86	79	0.67	81
Q48	0.08	97	0.78	78	0.22	82
Q49	-0.13	97	-0.47	79	-0.10	82
Q50	1.10	96	1.00	79	0.89	82
Q51	0.84	97	0.62	78	0.58	81
Q52	0.84	96	0.85	79	0.55	82
Q53	-0.45	92	-0.56	78	-0.60	80
Q54	0.13	95	0.12	77	0.51	80
Q55	0.07	68	0.40	57	0.27	59
Q56	0.47	92	0.24	79	0.60	80
Q57	1.64	86	1.58	79	1.71	76
Q58	0.23	95				
Q59	1.16	94				
Q60	-0.47	95				
Q61	-0.22	95				
Q62	0.19	95				
Q63	0.32	94				
Q64	0.16	95				
Q65	0.15	95				
Q66	-0.48	94				
Q67	-0.04	94				

Scales Analysis

Title	Question Numbers	ANOVA Significance (Pr > 0.05) (Y/N)	Waller-Duncan (A, B, C) JH	School A	School B
Pace and Pressure	16, 20, 28, 29, 30, 32, 42	N*	___	___	___
Methodology	7, 9, 11, 45, 46, 47, 48, 53	Y	A	B	C
Comfort Level	3, 8, 13, 14, 45, 46	Y	A	B	B
Attitudes, Outlooks and Values	10, 17, 19, 21, 22, 24, 43, 50, 51	Y	A	B	B
Teacher Interaction	1, 2, 3, 4, 32, 33, 53	N	___	___	___
Retention	28, 29, 52	N*	___	___	___
Timetable	27, 34, 35, 37, 38, 39, 40, 41	N	___	___	___
Work Habits	17, 21, 24, 50, 51	Y	A	A/B	B

* results that are not significant for these scales provide a positive orientation for the Copernican Model timetable at JH

A key attribute of the Waller-Duncan test is that it provides variance analysis for grouped multi-question means. Essentially, this technique facilitates the analysis of scales, whereby a scale is considered to consist of a cluster of survey questions representing strong thematic unity.

NOTE: Schools with the same letter (A or B or C) show means that are not statistically significant.

QUANTITATIVE ANALYSIS OF JOHNSTON HEIGHTS STUDENT RESPONSES TO INTERVIEW QUESTIONS

Twelve students, three at each grade level from 9 to 12, were asked to discuss and comment on various aspects of the Quarter System Timetable as it is employed at Johnston Heights Secondary. Where possible these student expressions have been categorized and quantitatively analyzed. The top three categories of responses to each question are identified. The total number of respondents will not necessarily equal 12 as some students provided responses that fell into more than one category.

"Please describe a very effective and highly successful 2.5 hour class."

N	Category of Response
9	- variance of pace with frequent change of activity
4	- student centered
2	- not strictly an academic focus
3	- other

"What is the teacher role in creating this successful class?"

N	Category of Response
10	- maintain student interest level
7	- ensure that learning does take place
3	- provide clearly understood explanations
4	- other

"What is the student role in creating this successful class?"

N	Category of Response
7	- listen and follow instructions
6	- to work
4	- stay focused
2	- other

"Over 55% of J.H. survey respondents felt they were comfortable expressing their viewpoints and concerns in class. This percentage was noticable higher than those found at the other high schools represented in this survey. What factors do you think are responsible for this difference?"

N	Category of Response
10	- increased opportunity to get to know teacher and students via 2.5 hour class
4	- the emphasis on interaction and group work
3	- efforts of teachers to value student opinion
0	- other

"What role do you feel the 2.5 hour classes have in developing this level of comfort in expressing viewpoints and/or concerns in class?"

N	Category of Response
5	- concentrated time with peers leads to greater intensity of bonding
5	- teaching methodologies used by teachers
5	- other

"Student survey data indicated that close to 50% of J.H. students felt that their academic achievement had improved under the quarter system timetable. What do you think is the main reason for this improvement?"

N	Category of Response
8	- only having to concentrate on two courses at any point in time
3	- higher comfort level leads to better participation
2	- more time to ask questions of teachers
5	- other

"Student survey results indicated that there may be two key factors responsible for significant academic improvement: an increased academic focus associated with 2.5 hour classes; and only having 2 classes to concentrate on at one point in time. Which of these factors do you consider to be most significant?"

N	Category of Response
9	- only having to focus on two classes at a time
3	- they are both important
0	- the 2.5 hour class length

"Under the quarter system timetable you may find that you could have as much as one year and a half between one level of course and the next. Describe your feelings related to this issue."

N	Category of Response
9	- concerned about it
2	- not a big deal
1	- unsure

"If you are concerned about the potential problem associated with amount of time between courses of the same discipline, how are you dealing with it?"

N	Category of Response
12	- review materials more often
9	- retain notebooks once a course is completed
8	- share information with friends
5	- other

"What changes, if any, would you make to this timetable?"

N	Category of Response
4	- the system is okay as it currently exists
4	- change the length of lunch time
3	- alter the length of classes (shorter)
5	- other

"What do you understand to be the purpose of flex time activities?"

N	Category of Response
10	- no real understanding of it
5	- interferes or causes problems with lunch
2	- for individual help
3	- other

"What aspects of the flex time activities do students respond well to?"

N	Category of Response
6	- open gym
4	- none
4	- clubs or things like band
2	- other

"How could flex time activities be improved?"

N	Category of Response
6	- increase or establish accountability
3	- clearly define the time expectations and schedule it
2	- it's a joke
3	- other

"In your opinion are there subjects which are not well suited to the quarter system timetable?"

N	Category of Response
7	- Math
4	- P.E.
3	- Band
5	- other

"In your opinion are there subjects which are well suited to the quarter system timetable?"

N	Category of Response
6	- humanities (English/Social Studies)
1	- P.E.
1	- H.Ec.
2	- other

"What makes a particular subject 'not well suited' to this timetable?"

N	Category of Response
6	- too many concepts to learn too quickly
4	- boring after 2.5 hours
3	- lack of consistency or ability to practice over a full year
3	- other

"Are there any changes (modifications) that could be made to improve the suitability of this timetable for some courses?"

N	Category of Response
3	- consider 20 weeks or a semester approach for some subjects
2	- have some subjects (French, Band, P.E.) alternating daily for the full year
2	- modify teaching styles
4	- other

"What has been your experience regarding satisfaction with the amount of school work that you are completing?"

N	Category of Response
7	- feels very good about the amount of school work being completed
7	- there is quite a bit of pressure so it is hard to balance social life
3	- depends on the balance between hard/easy courses that one is taking
4	- other

"Discuss your experiences and provide some insights into the quarter system timetable."

N	Category of Response
7	- much easier to stay organized by focusing on only two classes
5	- ensuring that you have a balance between hard and easy courses is important
3	- it is good for academics
8	- other

MEMO FROM KRISCHE/BREEN

To: **Date: April 19, 1994**

RE: Student selection for interviews.

Following is a proposal related to timeline and criteria for the student interview component of the timetable ananlysis.

Selection Process

It would be desirable to have a teacher of an English class at each grade level from 9 to 12 involved in approaching students to participate in an interview regarding the timetable. 5 students will be required at each grade level with consideration being given to some general criteria which has been listed below. Interviews will be approximately 20 minutes in length and will be scheduled between 12:00 and 4:00 on Monday May 9th with the balance being scheduled on the morning of May 11th. Selected students will be required to meet with the interviewers for a short debriefing session at 12 noon on Monday May 2nd.

Student Selection Criteria

Consideration should be given to the following factors in approaching students:

- an approximate gender balance
- representation of some different program interests (ie. E.S.L., Music, A.P., Special Needs)
- a range of academic performance levels (hi, ave, low)

Proposed Timeline

- April 25-28 teachers approach students re: participation and provide information on debriefing meeting.
- April 29 teachers provide list of selected students to __
- May 2nd twenty minute debriefing meeting held at 12 noon at _____. Permission forms issued and sign up for interview times.
- May 4th permission forms in to _____
- May 9 & 11 interviews as per schedule

Guideline Student Interview Questions

1. Feedback from a student opinion survey indicates that a certain type of student finds the Quarter System timetable to their liking. How would you explain this and what has been your experience?

   Compared to students surveyed at other high schools, a significantly higher percentage of students at Johnston Heights indicated that they were satisfied with the amount of school work they were completing. At the same time, some Johnston Heights students felt that the speed and demands of most courses brought too much pressure.

   a) How do you view this and why?

2. Please describe a very effective and highly successful 2.5 hour class.
   a) what is your role in creating this successful class?
   b) what is the teacher role in creating this successful class?
   c) in your opinion, how important are changes in activities or teaching methods during such a class? Explain.

3. Over 55% of Johnston Heights survey respondents felt they were comfortable expressing their viewpoints/concerns in class. This percentage was noticably higher than those found at the other high schools represented in the survey.
   a) What factors do you think are responsible for this difference?
   b) What role do you feel the 2.5 hour classes have in developing this level of comfort in expressing viewpoints/concerns in class?

4. Student survey data indicated that close to 50% of students felt that their academic achievement had improved under the quarter system timetable.
    a) What do you think is the main reason for this improvement?

   Student survey results indicated that there may be two key factors responsible for significant academic improvement: an increased academic focus associated with 2.5 hour classes; and secondly, only having 2 classes to concentrate on at one point in time.
    b) Which of these factors do you consider to be the most significant? Explain.

5. Under the quarter system timetable you may find that you could have as much as one year and a half between one level of course and the next.
    a) Describe your feelings related to this issue. (possible probe: Bi, Ma, La)
    b) If you feel this is a potential problem, how are you dealing with it. How do your teachers deal with it?

6. a) What do you understand to be the purpose of flex time activities?
   b) What aspects of the flex time activities do students respond well to
   c) How could these activities be improved?

7. In your opinion are there subjects which are particularily well suited to the quarter system timetable? .....not that well suited?

   What makes a particular subject well suited, or not well suited to this timetable?
    a) Are there any changes (modifications) that could be made to improve the suitability of this timetable for some courses?

8. a) What changes, if any, would you make to this timetable and why? What other improvements might be possible?
   b) Is there anything else about the quarter system timetable that we have not touched upon that you feel is significant?

Representative Sample of Student Comments

Student comments have been grouped according to the following categories: Attitude/Satisfaction, Methodology, Comfort Level, Achievement, Pace/Pressure, Retention, Suitability, Other, and Flex Activities.

ATTITUDE/SATISFACTION

- "Students also must take more time to do more of their homework. I know that once I'm out the doors I don't want to do any more work, its already been 2.5 hours, I'm already bored with it. Some of my teachers give a quiz every day, a small percentage of the mark, but if you do the work and the homework, you'll do well and the teacher knows where everyone is and can review hard sections. Must be able to keep up or will fail."

- "....you can focus more on that course instead of having a bunch of subjects with homework, you can really study one or two."

- "I went to a different school other than Johnston Heights and we had a normal system so I have had experience with both of them and I found that I got less work with the other system whereas with this one you get more because it is more compact. I don't find it harder. I'm not sure if that is because maybe I'm better at some of the things, but I also see that it is better to focus on each of the two subjects, so I like this system better."

- "....you complete lots of work, some courses it can be rushed, you have lots of stuff to cover."

- "....wish I could be doing more, but too concerned about my social life."

- "When learning stuff kind of fun, so that is one way to judge satisfaction. In the first term took integrated socials/earth science. Know I learnt a lot even though had to spend lots of hours in the library. Learned a lot about the environment. Now have a job and am taking biology. This is really hard, but the stuff I learned last term is helping me,.....when I'm under pressure I cannot learn."

- "2.5 hours can get kind of boring"

- "...most would find success....it's easier to concentrate on only two courses"

METHODOLOGY

- "Now it is more important to do group work and to do better activities. Like in French, which I have right now, we play a game every day which can give us bonus marks, but also reinforces our vocabulary. It also gives us a chance to get out of our seats and do something else. 2.5 hours is such a long period of time for people to sit.....it has to be interesting."

- "There has to be much more group work. With the 2.5 hours, they can't have you just sitting in your seats."

- "Teachers need to change their basic teaching style. They always ask us, so I've thought about that. Probably more group work, less textbook work."

- "2.5 hours is great if used appropriately, if teachers adjust, once this all settles out it will all be great."

- "...mostly it depends on the subject, in humanities we did a lot of different things, videos, charts and stuff, but in math the teacher tells us to do the work and we do it and its not very interesting."

- "...if you're doing the same type of thing, copying and copying, then it is really boring. You wander, but if they are using video, discussion and the board, and handing out papers, then you're involved."

- "....group work is important in the improvement of academic achievement."

- "I think the group work really helps, helps you remember because it is not just the teacher telling you."

- ".....I mean having a little bit of a break where you do something entertaining rather than sit down work. Teachers must make it exciting, bearable I guess. .....for example, math is a bad course for 2.5 hours because you totally lose your train of thought and you just want to be out of there."

- "Make it exciting.....so you don't have time to be bored. In that sense it is really good."

- (changes in activity)"pretty important because in society today, people have short attention spans, as seen in television etc., so avoid people drifting away."

- "...allow you to talk and not make the class extremely boring by just talking and talking. Let you work at your own pace as long as you are doing the work."

- "The students don't have time to forget material. Teachers have more flexibility with their methods of teaching."

METHODOLOGY cont'd

- "...if the 2.5 hour class is teacher in front of the class, reading, dictating, all you can do is try to absorb the information and squeeze it out on a test, but you don't really learn anything. If the teacher makes you participate so you can have fun while you are learning it is a lot better than just writing down notes."

COMFORT LEVEL

- "...in a way it becomes a small little family or a small little group. If you have a problem with the group, that is where it gets more difficult. There are both sides to this question. There is so much more time for you to talk to everybody and get to know them. It is almost like they are getting to be like your friends because you are with them so much."

- "....you are with them the whole time and you get comfortable with them. In the old system, in one hour you are just there, you don't get to know people.....You don't really make more friends in this system, you just get more comfortable with the people."

- "Teachers give you opportunity to speak out, they don't put you down, actually listen to what you say, may not agree, but listen as long as you are expressing it properly. Teachers do things to get students to know each other in class."

- "....maybe because we have a strong fine arts department, more people can express their feelings."

- "I've noticed that I'm closer to my classmates this year than previous. That could be just teachers' teaching methods also."

- "In old 5X8 saw more people and talked to more people, but here see less, but get to know them more."

- "...around people every day for 2.5 hours so get to know them better than just 3 hours a week."

- "...fact that only have two classes to worry about, have sort of bonding thing happening faster, class sort of becomes a big group, you're not really afraid to say anything, your class is like all your friends, you have enought time for that. First system was kind of choppy, only about 45 minute classes."

ACHIEVEMENT

- "I don't really think any students are doing that much better than they did before. I think this is an experimental thing, teachers are marking easier. This is how our French teacher explained it to us. There are just so many new things all the time...."

- "I like this timetable. Before my grades were C+ and B. Now my average is an A. It is much easier to concentrate and study for tests when I have less classes to think about. I was shocked that I even made it on the first class honor roll."

- "Maybe it (improved academic achievement) had a bit to do with the fact that there was more time to ask the teacher questions, there was more time for teachers to walk around and make sure students understood everything and in a lot of cases the class sizes were a little smaller last year."

- "I myself improved, I made the honour roll, I think it is because you are concentrating on those courses so much. The final exam comes around and you remember everything that you've learned from the first day of class. You have the ability to go into depth. With the 8 class system you were in there, then you were gone and you didn't have the class again for 2 days. Recall for final exam you couldn't remember for the life of you what went on during the first month or two of school."

- "comfort level is important for achievement, and just seems more freedom with this system, atmosphere seems better"

- "...think it really has to do with the teacher. In the old system had only a minute or two with the teacher. Now can really spend time with students. Can now really help students with the help they need.....also with stress level, pushed for time so want to try harder to pass, so put more time into homework and actually working in class."

- "...integrated subjects makes classes more interesting and easier to learn."

- "more people take it seriously and you have more intense class time with the teacher." (regarding reason for improvement in academic achievement)

- "a better atmosphere with more participation and people getting into a class" (response to factors important in improved academic achievement)

- "This new timetable has improved my academic standing as well as providing a want and need to learn. It is an exceptional timetable with exception to the problem with music."

PACE/PRESSURE

- "....Biology, it was flying right over my head. I mean I totally flunked that class. I learned something, was tested next day, failed the test, given a project, couldn't understand the project, so didn't do it, didn't want to go in for any extra help, just hopeless, it all just crawled up behind me. I ended getting 35% in the course. Normally I am an honour roll student. I've been on the honour roll since grade 8, I had straight A's all through elementary school. This is the first class that I've had any less than a B in. It is too concentrated!"

- "My experience with the quarter system was I find it fine because the counsellor arranged it so that I had my hard courses in the afternoon and some of the easier courses in the morning for each of the terms so I'm not over burdened with too many hard courses."

- "...it is true that the way you structure your courses can bring a lot of pressure. It depends on your courses. I'm in Math 12 right now and the way that they are throwing the math at you, it is a lot of pressure."

- "Pressure, stress does not bother me as long as you get your homework done you are fine, I keep up with my homework."

- ".....have more time to concentrate on their courses, don't have to worry about so much homework from so many teachers. That caused students to not do their work."

- "only having to concentrate on two classes relieves the stress."

- "...they go too fast, your teachers rush you too much, they make you do everything right away, if you have a deadline for a project then you can't hand it in any later because then we're into a new subject."

- "...you complete a reasonable amount of work but don't remember a lot because you do it too fast.....too overwhelming."

- "...there is pressure but it feels good and forces you to accomplish things."

- "...change of pace is important, don't get bored as fast. Group work is good, before I hated it now I like it. Don't realize how much it helps you."

- "...you get a lot of work done, but you are forced to do it really quickly, 10 weeks then the final, you get the same amount of work done, it just comes faster. I've been more stressed out this way, but I like it a lot better. It takes up more of your time, you don't have as much free time after school."

PACE/PRESSURE cont'd

- (stress as a part of the learning process) "...is good because certain people with what they want to do in the future deals with a lot of stress and this way they get used to it."

- "...math is hard, couple of chapters a week, that's too fast for me. I need to ingest stuff and can only concentrate on one concept at a time."

RETENTION

- "....maybe because it is concentrated, you only have two classes you kind of do it all and get it over with. I think everything is remembered more for the finals. That is something I did extremely well on last year was the finals. I usually got C+ on finals, but last year in a couple of my classes I got A's. I guess it was because it was on stuff that I had recently learned."

- "I think that if teachers do a good review when you first get back into the class it will all kind of come back. I don't know what you call it, but.....when you learn something, you lose so much of it, then you won't lose any more. I found the first couple of weeks of French a little difficult, but after we had finished the review, which my teacher did a very good job of, it all came back to me."

- "school should try to schedule so there is equal time in between (courses)"

- "I usually keep all the work that I've done and at the end of the summer I usually go over it to make sure you have an idea of it. I'm more into the academic work, some of my friends just throw away their binders, but I usually keep mine."

- "I think that more people keep their books in this system than in last years because we had courses till the end of the year and now courses end near the beginning of the year and it is harder to remember."

- "I myself improved, I made the honour roll, I think it is because you are concentrating on those courses so much. The final exam comes around and you remember everything that you've learned from the first day of class. You have the ability to go into depth. With the 8 class system you were in there, then you were gone and you didn't have the class again for 2 days. Recall for final exam you couldn't remember for the life of you what went on during the first month or two of school."

RETENTION cont'd

- "Everything does go pretty quickly, so it is good for short term memory sort of thing, but by the time it comes around the next time a lot of it is gone. Sometimes the intervals are pretty long."

- ".....sometimes good, sometimes bad.....good if you get courses in the same subject back to back."

- "...teachers know our level, they start almost with a clean slate, lot of teachers helped. I lucked out with good teachers this year. For myself, having friends taking it in different terms and helping them out really helps."

- "...only go through one thing each day, you wouldn't go on to a whole new topic in that same class."

- (academic improvement) "..depends on what course, for French, there is no time to forget verbs, keep using it, key to remembering is constant usage."

SUITABILITY

- "I can see how it suits some students. For me I have to ingest the material, so I am taught it one day, then expected to know it the next, and I usually have difficulty. Other people.....get it right away, so they like it."

- "In Science I did not get enough experience, hands on stuff, because the teachers have to get straight to the point and there is not as much time. We didn't do any dissections or any of that hands on type of thing in order to reinforce what I was learning so it was more like fact, fact, fact, memorize, and then we're on to the next thing. And I just couldn't handle that."

- "...really depended on teachers too, those who know how to use it (2.5 hours) to their advantage really worked well."

- "....people who have trouble sitting and concentrating might have problems, but I don't know a lot of people who have problems with it."

- "P.E. need endurance and energy, same with band, though theory now, but lost lots of students as they don't want lots of theory,.....hard to keep skills up."

- "you have to be a student who likes school and don't really do anything after because I'm involved in sports and stuff so that takes up another couple of hours everyday. Somebody who likes school and wants to succeed."

SUITABILITY cont'd

- (academics not well suited to timetable) "...move too fast, give you too much information in such a short period of time."

- "Like the old system it has its advantages and disadvantages. Advantage is you are maybe more focused on the subject, but you can get really sick of it really fast."

- "...can't expect to learn a years' music and keep that level only in 10 weeks. Takes time to develop. Math is hard because of so many concepts, takes me time to learn new one, learn one then get another and just snowballs."

- "the nature of the course important, some courses take time, they can't be rushed."

- "math is not (well suited) as some people take a long time to grasp, should be year long course so we can learn it without pressure. P.E. is not good as should not have 10 weeks of physical activity, then 40 weeks off. Hard ones like sciences should be spread over time, need to have a longer time to learn the material, 2X20?, creates less pressure"

OTHER

- "a lot of smarter teachers change assignments, tests, some even keep your notebook, big projects, teachers pretty much know what is going on. It is not totally an advantage, but not really something you can rely on." (on getting other people's notes)

- "....at first I was kind of uneasy, and I was totally against this timetable. Now that I am in it, I think it is totally good because you can learn a lot more. I was originally against it because of the fact that it was change, the fact that there would be 2.5 hours in one class, just having to sit there, that was the big thing, but now I am comfortable with it."

- "With this timetable if you are absent you are in big trouble. Was in hospital and had to get a tutor, with so many kids skipping out it makes it really difficult."

- (on possible further changes) "...don't know, being human am pretty resistent to change."

- (on possible further changes) "I like it, I'm comfortable here, there will always be ups and downs, if you try to cure downs, then will change ups."

OTHER cont'd

- "grades seem to go up, now it is a lot harder to skip, if you skip you miss a lot,"

- "I've found that with most people that I've asked they like the quarter system better."

- "two classes because in 2.5 hour class, I tend to start to lose focus in the last quarter of the class." (differentiation between focus on two classes and focus within one class)

- "It is difficult staying in one room for 2.5 hours and staying on task."

- "keeping focus within system important. Have one hour fifteen minute classes, then 10 minute break, but that's not enough. Maybe switch (alternate) courses, but have 2.5 hours still each course per day."

- "...sometimes I hate it and sometimes I like it. It really doesn't matter which timetable is in effect because I hated things about the old system as well."

- "By the time you get used to your class and teacher, it's time to go to another course."

- "The timetable in general works quite well, however, due to the amount of material that needs to be covered, field trips are not very common."

- "It isn't bad. Sometimes I get bored or whatever but I've kept up my A-B standard so for me it is fine. Some things like Math are a bit stressful cause it's like you have enough time to learn it, but sometimes not understand it, so the teacher just goes on with their lesson when you want to back up and understand what you're doing. I love having Acting for 2.5 hours and things like that,...of course though!"

- "With regular attendance it is much easier for students to do better in school. I find it so much easier to concentrate and stay organized."

- "Administrators should understand that although this timetable is positive in many ways, there are factors such as amount of content, that need to be taken into consideration. Also, there are students that are able to memorize and pay attention for 3 hours at a time, but there are others that can not. Those people are at a real disadvantage."

- "I think that whatever the timetable is there will always be about the same number of advantages & disadvantages to complain about.."

OTHER cont'd

- "...I get bored in long classes because teachers do not adjust to the system properly."

- "..good for an ESL student because we just have to study two or three subjects each quarter."

- "This timetable works for me cause I don't have to worry about getting final exams all at once."

- "Math Honors is hard enough without having it compiled into such a short time period."

- "I even know some people who sold their notebooks. It is just a lot easier if you talk to someone to get an idea of what the course is all about, find out what you have to do."

FLEX TIME

- "I don't really use them. I don't know anyone who has gone to flex time activities."

- (laughter) "They are not even calling it flex time anymore, teachers have study sessions. Basically, like everyone else in the school, I have a 70 minute lunch."

- "What I hear is teachers needed more time in the school year. I use flex time a lot because lots of my activities use this time for rehersals, etc. It is easy to use up flex time if you are involved, but a lot are not. I see lots of it going to waste, lots of people go to the mall."

- "Eliminate flex time activities, no one really does them."

- "One week they gave out a sheet which we had to turn back into the teacher, but my teacher didn't really care." (on methods of monitoring flex time)

- "There is no purpose, I see them as extra time where you have fun. Says in the agenda where you have to have 15 minutes a week. It is ridiculous. It's your time."

- "Probably what they would do even if there were not flex time, like open gym for volleyball, basketball" (on what flex activities students respond well to)