HOW IMMIGRANT STUDENTS FROM PACIFIC RIM COUNTRIES PERCEIVE SCIENCE EDUCATION IN CANADIAN CLASSROOMS

by

LOUIS ANDREAS MITSIS

B.Sc., The University of British Columbia, 1993
B.Ed., The University of British Columbia, 1994
M.A., The University of British Columbia, 2005

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES

(Science Education)

THE UNIVERSITY OF BRITISH COLUMBIA

April 2005

© Louis Andreas Mitsis, 2005
Abstract

This study documented the opinions and ideas of twelve immigrant students from Pacific Rim countries in a Canadian high school setting. Data was obtained by in-person, individual interviews.

It was not very surprising to discover that there are major differences between Pacific Rim and Canadian science classrooms, as perceived and experienced by the students. Many of the stereotypes that educators hold of the Pacific Rim system of education were confirmed by several of the students that were interviewed. What was surprising is that many of the teaching methods used in the Pacific Rim system have been embraced by the students, and have been proven to support student success in science.

After the completion of this study, it was difficult to determine which system of science education the students prefer. Most of the students interviewed stated that they generally disliked most of the methods and strategies used in their home countries. However, many of the students contradicted themselves by stating that the Canadian methods did not pose much of a challenge in order facilitate learning. To allow Pacific Rim immigrant students to adapt smoothly to our system of education, a combination of western and Pacific Rim methods should be incorporated.

This study has implications for teachers who teach Pacific Rim immigrant students in secondary schools. Canadian science teachers, and all teachers in general, must not be too quick to judge and criticize the strategies and methods used by teachers in Pacific Rim countries. We must accept that some of their methods, regardless of the difference in philosophy, do work for many students. Canadian teachers should continue to use the strategies that they use comfortably, and try to incorporate parts of the Pacific
Rim system. Perhaps this will allow Pacific Rim immigrant students to adapt to our education system and our culture in a smoother fashion.
# Table of Contents

Abstract......................................................................................................................... ii

Table of Contents........................................................................................................ iv

Acknowledgements...................................................................................................... v

Chapter 1 Introduction................................................................................................. 1

Purpose......................................................................................................................... 2
Background................................................................................................................. 2
Significance of Proposed Study.................................................................................... 4

Chapter 2 Literature Review......................................................................................... 5

The Model Minority Stereotype.................................................................................. 5
Parental Involvement................................................................................................. 8
Family Values.............................................................................................................. 11
Classroom Environment............................................................................................. 12
Pacific Rim Immigrant Student Social Skills.............................................................. 16
Summary..................................................................................................................... 17

Chapter 3 Methodology.............................................................................................. 18

Introduction................................................................................................................... 18
The School and Participants....................................................................................... 19
Interviews..................................................................................................................... 20
Reliability and Validity of Methodology..................................................................... 23
Summary..................................................................................................................... 24

Chapter 4 Data............................................................................................................ 25

Classroom Environments......................................................................................... 25
The Meaning of Academic Success............................................................................. 32
Student Preference of Science Experience................................................................. 43

Chapter 5 Summary and Analysis............................................................................. 47

References.................................................................................................................... 58

Appendix A.................................................................................................................. 59

Appendix B.................................................................................................................. 62
Acknowledgements

This thesis would not have been possible without the support, encouragement, and contributions from several individuals. I would like to take this opportunity to thank you all for your help.

First, I am grateful to the twelve student participants in this study for sharing their time, thoughts, and experiences with me.

Next, I would like to thank the A.G. Leventis Foundation for their financial contribution towards my M.A. Your generosity will never be forgotten.

I would also like to thank my sub-committee advisors, Dr. Lee Gunderson and Dr. Samson Nashon, for helping me shape and refine my study.

A heartfelt thank you goes to my thesis advisor, Dr. Jim Gaskell. I cannot imagine working with a more patient and supportive supervisor. Thank you Jim for your guidance and words of wisdom throughout the entire process. This study would not have been completed without you.

Last, but certainly not least, I would like to thank my parents, Andreas and Eleni. I truly appreciate the encouragement and moral support that you have given me throughout this study.
CHAPTER 1

Introduction

Students from Pacific Rim countries have often been labeled as the "model minority" by the media. That is, a group of students who are diligent, respectful, and excel in academics. This notion has been dispelled by many educators, as they realize that many Asian students fail to learn or reach the goals set by their teachers, parents, or even themselves. The reasons for this failure are as complex as the cultural backgrounds of these students. Such students have many educational needs that are sometimes not met by the Canadian educational system. This is particularly true of immigrant students.

During my ten-year career as a science teacher in a school with a high population of Pacific Rim students, I have become very frustrated with the attitude held by many students, parents, and even educators that Pacific Rim students are all model students who succeed in the academic courses. Although there might be some truth to this statement, it must also be acknowledged that many immigrant children from Pacific Rim countries have great trouble adapting to our system of education and our way of life, regardless of whether they attain low or high grades. I have become tired of seeing fellow teachers group all Pacific Rim students into one category — the "model minority stereotype."

The Canadian system of education differs greatly from the Pacific Rim system. In general, Pacific Rim children are taught as a class group in their native lands. Everyone is taught the same information, at the same pace, and at the same level. Lectures, group recitation, examples, and rote memory are the major learning methods. A fact-learning
system is stressed, and no personal discussion is encouraged. Students are called upon to answer questions, and rarely do they raise their hands to volunteer a response. This is very different from our system of education, making it difficult for immigrant students to adapt.

In working to improve the cognition of Pacific Rim immigrant students in a science classroom, it is important to first determine the major differences and similarities between the Pacific Rim science classroom and the Canadian science classroom, particularly from a student's perspective. This study will explore the perspectives of students who have experienced both systems of education. It will describe what they like and dislike about both systems, from their perspective. I hope to attain a better understanding of the needs of recently immigrated Pacific Rim students and what strategies science teachers can use to improve the chances of student success.

**Purpose**

The purpose of my study is three-fold.

- To describe the major differences between Pacific Rim and Canadian science classrooms as perceived and experienced by the students.
- To identify those characteristics of each system that, from the student’s perspective, support or do not support student success in science.
- To determine which system of science education the students prefer overall and why.

The students have been asked to participate because they are relatively new to the country of Canada and have experienced science education in both Pacific Rim and Canadian classrooms.

**Background**

I became interested in the topic of Pacific Rim immigrant children for various reasons. The greatest reason is that I teach in a school with a high population of Pacific
Rim students, many of whom are immigrants. As a science teacher, I would like more information as to how I can change or modify my practice to suit the needs of these students.

Another reason is the traditional school campaign, which began in Richmond in the mid 1990s, but has now been dissolved. The traditional system is a “back to basics” approach (Hintz, 1998). “Our method of instruction is more structured and teacher-directed with less emphasis on newer trends in co-operative learning,” the principal of one of the traditional schools claims. Programs are characterized by direct instruction, clear scope and sequence, focus on subject content, and no combined classes. Instruction clearly draws on a transmissive model of education.

More than half of the parents signing a request form for a traditional school in Richmond were of Pacific Rim origin. Many explanations are offered for Pacific Rim students’ success in school. The most commonly embraced credits cultural values and traditions. I believe that traditional schools have many of the qualities encompassed by schools in Pacific Rim countries. There has been a great demand for a traditional school in Richmond, particularly by Pacific Rim parents, because they believe that their children will have greater success under these conditions. I would like to know the point of view of students who have experienced both systems of education. The assumption is that students’ point of view must be taken into account when developing effective teaching and learning strategies.

This study will focus on Pacific Rim students who are recently removed from the Pacific Rim school system and have experienced mainstream public education in Canada. Information will be obtained from students who have now experienced both systems of
teaching. Their statements and responses during the interview process may help science educators determine what is best for these students in order to ensure a high degree of learning for future Pacific Rim students who are recent immigrants of Canada.

**Significance of Proposed Study**

I believe that this study may have some impact in several schools in the lower mainland of Vancouver, but particularly in Richmond where there is a large population of Pacific Rim students. Few if any studies have been conducted which have given the student a voice on this matter. I believe the results of this study will give important insight into the needs of Pacific Rim students who have recently immigrated to Canada and who strive for success in a Canadian science classroom. In addition, it will give science teachers the ability to adjust and modify their strategies and techniques in order to allow these students to adapt to the Canadian school culture and have a rich, rewarding science education experience.
CHAPTER 2

Literature Review

This chapter will outline some of the main differences between the education systems in Pacific Rim countries compared to that in North America as determined by previous researchers. Another goal of this chapter is to give some information on the successes and failures of Pacific Rim immigrant students. It must be acknowledged that most of the published research that has been conducted in the area of Pacific Rim immigrant students has taken place in the United States. It will be assumed for the duration of this document that the systems of education in Canada and the United States are very similar, and that Pacific Rim immigrant students would have similar experiences in both countries.

The Model Minority Stereotype

The Asian American population, composed of immigrants, refugees, and the U.S.-born descendants of immigrants from Asia, has been growing rapidly over the past three decades (Asher, 2002). Asian Americans have typically been defined, within the educational and social contexts of the United States, as the “model minority” (Asher, 2002). The educational success of Pacific Rim immigrant students, especially in the area of science and mathematics, has promoted discussion and continuing interest among researchers. Labels such as the “model minority” and “Asian whiz kids” are used with some regularity (Lee, 1991). In addition, the educational systems of several Pacific Rim countries (particularly those of Taiwan and Hong Kong) from which these children come are often held up as models for North American educators to emulate.
Not only are the students from Asian countries succeeding academically, Asian students in the United States, under a similar educational environment, also perform at a higher level than White American students (American College Testing, 1989; College Board, 1989). Another recent study (Mau, 1997) indicates that both Asian American and Asian immigrant students scored higher than White American students on current academic proficiency. Other recent studies comparing Asian American students and White American students seemed to support these contentions (Mau, 1995; Peng & Hill, 1995). This seems to suggest that cultural upbringing may be a strong factor contributing to the educational success of both Asian students in Asian countries as well as in North America (Mau, 1997).

Previous research has shown that Asian students spend considerably more time in academic related activities than North American students. Results of the Mau study indicated that both Asian immigrant and Asian American students spent significantly more time on homework than did White American students. White American students spent more time than Asian immigrant students on extracurricular activities and doing homework at school, while both Asian American and Asian immigrant students spent more time doing homework at home.

Both Asian American and Asian immigrant students perceived higher parental educational expectations than White American students (Mau, 1997). This study showed that the value of hard work was present in the families of early Asian immigrants, and was well preserved in the families of more established Asian Americans. Consistent with the previous studies, this study also showed that Asian American students perceived
significantly higher parental educational expectation than their White American counterparts (Mau, 1997).

For all of the documented successes of Pacific Rim students, many North Americans, including educators, mistakenly believe that all Pacific Rim immigrant children are model students. They share the myth that all Asian American children are diligent, respectful, intelligent, good students (Yao, 1997). However, because of their cultural and educational backgrounds, these children sometimes react to the North American public school system with bewilderment or disinterest. Teachers should not be dismayed if they find the opposite is true in their classrooms. Some Asian students, perhaps more than estimated, fail to learn or reach the goals set by their teachers (Yao, 1987).

The "model minority" label silences the particular experiences and multiple voices of Pacific Rim students to create a single, and often false, representation. Under this stereotype, Pacific Rim students are largely represented as being untroubled and compliant, excelling in math and science, and succeeding in spite of many racial and cultural barriers.

Lee and Peng (1991) concluded that the model-student stereotype so prevalent for Asian students "may mask some serious problems among Asian-American students that urgently need attention." One of the main problems for these students is that they often become high-risk youth. A second problem is that even those Asian students who continue into postsecondary education sometimes do so with English language deficiencies that may be addressed inadequately by their schooling and by the students themselves (Davis, 1992).
In another study, Yan and Gaier (1994) found that American students attributed academic achievement more often to ability than did Asian students. When parents believe success in school depends for the most part on effort rather than ability, they are more likely to encourage hard work and participation in activities related to academic achievement. The idea that Asian students spend more time on school work and considerably less time in non-school related activities than White Americans and other racial/ethnic groups seems to reflect this cultural value (Stevenson, Lee, & Stigler, 1986). While it is true that many Pacific Rim immigrant students do very well in North American schools, it is also arguable that those who do so succeed not through any particular intrinsic academic superiority, but through a high cultural value placed on academic success resulting in hard work, strong motivation, and strong parental support. These characteristics are most evident in East Asian students who are immigrants themselves and who still identify closely with their country of origin (Borden, 1998). It is also true that many Pacific Rim immigrant students do not meet the academic expectations of their parents or teachers, or do so with great difficulties or deficiencies. It is for these students that we as educators must be careful in using the model minority stereotype.

**Parental Involvement**

The parental role is very important for children's success in school, regardless of ethnic and/or racial background (Yao, 1987). Most Pacific Rim immigrant parents have high expectations of their children's academic performance. They still value education highly and believe that a good education will eventually offer a good living. Thus, they put immense pressure on their children to strive for academic excellence (Yao, 1990).
Concerns about the future also shape the expectations from home regarding academic achievement and future professional paths. The desire to ensure their children's future financial security and success is often a consideration for Pacific Rim immigrant parents. This was one of the factors that influenced the participants' parents in the Yao study to direct their children toward academic fields related to science and/or business, and ways of planning ahead for success. This parental desire to ensure future financial security and success for their children was also combined with such considerations as occupational status and prestige. The combined desire for financial security and prestige contributes to the thrust from parents for science-related fields, particularly medicine, over humanities and the social sciences.

Another factor that may influence expectations from home regarding career choice is the parents' own academic and professional experiences and backgrounds, particularly as immigrants. Immigrant parents are often focused on ensuring better futures for their children. Science and business-related careers that offer financial security, prestige, and social respectability are considered "safe" options — guarantees of future success (Asher, 2002).

The findings of Asher’s study revealed that, in relation to academic achievement and career choice, these young Asian American students experience pressure to excel and plan ahead for careers that ensure future financial security and success (Asher, 2002). All participants of Asher’s study spoke of considerable pressure from those at home — parents as well as, at times, members of the extended family — towards academics. Although the participants experienced these parental expectations as pressure, they were also aware of their rationalization and/or internalization of this pressure. Thus, the external pressure for
high academic achievement was internalized as the students pushed themselves to excel and fulfill their parents' wishes. These students were aware that they encountered expectations of academic excellence, within and without the home, particularly because they were Asian (Asher, 2002).

Parents' lack of knowledge of the North American school system has further compounded the complex learning problems encountered by immigrant children. The parental role is very important for children's success in school, regardless of ethnic and/or racial background. Pacific Rim children are often motivated by their parents and relatives. They study hard because they want to please their parents and impress their relatives. This desire to please may be out of respect for authority figures and the need to bring grace to one's family, or in response to parental nagging (Yao, 1987).

One study by Mau (1997) investigates the differences in parental influence on academic achievement of Asian immigrants, Asian Americans, and White Americans. Results indicate that both Asian immigrants and Asian Americans spent significantly more time on homework and perceived higher parental educational expectation than did White American students. White American students, on the other hand, reported more parental involvement in school activities (Mau, 1997).

There are several factors that influence the level of Pacific Rim parental involvement in North American schools. Parental literacy level (both native language and English) and pre-arrival education are two such factors. Parents with limited English proficiency are least likely to help their children with schoolwork or participate in school activities. Recently immigrated parents are typically less fluent in English and have little knowledge about the school environment, which may limit their school involvement.
In North America, parents are often expected to be involved in many school functions, including open houses, school assemblies, and volunteer projects in the classroom. Along with parent participation in a variety of school activities, parents also serve on policy and advisory committees, working alongside educators in making important decisions. In contrast, the attitude of Pacific Rim parents toward parental involvement in the schools is radically different from that of North Americans. The idea of parents being involved is completely counter to the beliefs of most Pacific Rim parents. In their native countries, school administrators are expected to decide all matters, from curriculum to discipline, without regard to parental concerns or desires. Asians also hold teachers in high esteem, second only to parents. Little or no contact with the schools is expected or practiced by most Pacific Rim parents in their native countries. Yao stated that educators have supreme authority over students' learning and moral conduct and are "responsible for transmitting the required knowledge and proper moral standards to their students" (Yao, 1990).

In summary, the academic success of Asian students, regardless of new or established immigrant status, seems to be associated with high parental educational expectation and educational effort (Mau, 1997).

**Family Values**

Pacific Rim children are taught from an early age to view their role within the family and society in terms of relationships and obligations. Cultural values dictate that only those behaviours that maintain and improve the family name and home are considered valuable. Pacific Rim children are trained to think of the family first and must learn to put their personal desires and concerns aside.
This abiding obedience is also reflected in the attitudes of Pacific Rim parents toward professionals, including teachers, as individuals who have the expertise to fully understand and know what to do with children, without assistance from parents (Morrow, 1989). Since parents and the public do not take active roles in school affairs in their native lands, recent settlers from Pacific Rim countries find it difficult to understand parental involvement programs. The teacher is viewed as the expert; parents, therefore, feel it is inappropriate to tell teachers what to do about the education of their children (West, 1983).

If teachers are to begin to understand the Asian immigrant’s different value system, one must take time to look at each family as a unique entity (as opposed to treating all group members alike), and patiently and sensitively work with the child and family (Morrow, 1989). Unfortunately, this may be a difficult task for the average teacher, as the time demands on educators in North America are great.

**Classroom Environment**

One difference between North American and Pacific Rim cultures is the fact that Pacific Rim teachers are accorded much higher status than teachers in North America. In their native cultures, Pacific Rim students bow before teachers, rise, avoid eye contact, and ask no questions. The informality between North American teachers and students may seem confusing to the Asian student and is usually appalling to their parents (West, 1983).

The cultural backgrounds and values of most Pacific Rim countries condition students to expect considerable structure in the schooling process. Used to the lecture method, they may be confused by group activities and independent projects. To them, an
open classroom may seem disorganized. This does not suggest that North American teachers should abandon these teaching strategies. However, it may be helpful for the North American teacher to explain those strategies more carefully to Asian children, or even to give them more specific directions (West, 1983).

Immigrant students generally view learning as a task consisting of a large number of discrete skills to be learned in order, through rote memorization. They believe that those who acquire the most skills and can faithfully remember and reproduce them are the ones who are rewarded with the best grades and ranking (Gunderson, 2000). Pacific Rim students and parents often feel that Canadian schools are easier because there was much less material to be memorized (Gunderson, 2000). Secondary teachers must be concerned about cultural differences and how they affect their students’ learning.

Self-effacement and saving face are highly valued by the Indochinese (West, 1983). Pacific Rim students usually wait to answer or participate, unless asked by the teacher. Teachers who value positive reinforcement may not recognize that even positive notice may be embarrassing to a Pacific Rim student. Perhaps related to self-effacement is a characteristic North Americans perceive as shyness in children from Pacific Rim countries. Asian children have been socialized to listen, more than to speak; and when they speak it is in a soft, well-modulated voice (West, 1983). Similarly, they have been taught to be modest in dress, manner and behavior. Although many schools in Asian countries are coeducational, opportunities for social interaction between boys and girls are few. Again, cultural conflict can be very painful to those students who do accept North American ways (West, 1983).
Bui (1983) described conditions in a typical Southeast Asian classroom as follows:

"Classes were crowded; students were seated 12 across on benches, squeezed together without room for movement. Teaching was a one-way communication from teacher to students. There were no questions or discussion."

Pacific Rim immigrant children who attended school in their homelands are probably shocked by North American schools. The size of each class is less than half that in their native lands. The atmosphere of North American classrooms is much more relaxed, and students feel free to move around. Such an informal learning environment may give children the misconception that it is easier to go to school in North America. They do not think they need to take school as seriously as they used to. In addition, the teachers tend to be friendlier than their former teachers. Since Pacific Rim teachers tend to be quite authoritarian, children refrain from misbehaving and concentrate on schoolwork all the time. Some Pacific Rim immigrant children are simply not culturally prepared for North American instructional methods. Pacific Rim children are taught as a whole group in their native land. Everyone is taught the same information, at the same pace, and at the same level. Lectures, group recitation, examples, and rote memory are the major learning methods. A fact-learning system is stressed, and no personal discussion is encouraged. Students are called upon to answer questions; they do not raise their hands to volunteer a response (Yao, 1987).

Most Pacific Rim immigrant students need reinforcement from teachers and they work efficiently in a well-structured, quiet learning environment in which definite goals have been established for them. They seldom reveal their opinions or their abilities
voluntarily, or dare to challenge their instructors. Older immigrant students, who are accustomed to structured and passive learning conditions, rather than to the North American educational approach, which requires critical and divergent thinking, may perform well in rote memorization activities and mathematics operations, but may do poorly in creative activities. In Pacific Rim countries, educators are highly respected in society and have great authority over students' learning and conduct. Teachers are responsible for transmitting the required knowledge and proper moral standards to their students (Yao, 1990).

Children coming from Korea or Japan have experienced classrooms which are very teacher-centred, with very liberal use of the lecture method (even in elementary school), and very little unstructured learning or interaction among students. Noise is kept to a minimum, and memorization and repetition are the main study methods. The development of imagination, individual initiative, higher level thinking skills, and creativity are low on the hierarchy of educational goals. Standardized test preparation for high school or college is the main goal, particularly in middle and high school. A student from such an environment enters a North American classroom with very different expectations and learning skills from that of the child who has been brought up in the North American system which places high value on creative lessons, tolerates a good deal of background classroom noise, encourages spontaneity, and values individual thinking and creativity. In addition, any student with limited English ability would find it difficult to create clarity out of what might seem to be the creative chaos found in some North American classrooms. Directions would be much more likely to be misunderstood, student communication within groups would be harder to hear and understand, and the
amount of background noise would distract from the student's understanding of what was being said (Borden, 1998).

There is a large difference between Pacific Rim and North American classrooms. One cannot claim that one system is better than the other; both systems can be beneficial for different types of students.

**Pacific Rim Immigrant Student Social Skills**

Regardless of how outgoing or socially adept an ESL student might be, he or she may suffer a lack of acceptance by peers for months after admission to a school. This may be the result of racism or prejudice against a given racial group, or against immigrants in general. More often, however, it is the result of language and social limitations (Borden, 1998). Immigrant students are not accustomed to seeking counseling or professional help for two major reasons: (a) the unavailability of professional counseling in their native land, and (b) a reluctance to admit a need for assistance in handling their personal problems (Yao, 1990).

It should be recognized that the social adjustment to North America and North American schools and English language acquisition go hand in hand. Without a positive social adjustment, the student will not experience the peer situations necessary to learn English effectively, and without constantly improving English, he or she will not have the tools to interact with friends and pick up those behaviours so important in being accepted in the North American school, and more important, to North American society. (Borden, 1998)
Summary

The purpose of the preceding literature review was to outline some of the research that has already been conducted on the topic of Pacific Rim immigrant students. There have been very few, if any, studies that have been conducted on the perception of students in order to determine the system of science education that they prefer most. Most of the articles that have been used in the literature review outline the differences between the two systems of education, but none have actually asked the immigrant students, who have experienced both systems of education, which one is best for them. I hope to develop insight that will be beneficial to new Pacific Rim immigrant students and the teachers who will be teaching them.

The next chapter will focus on how data was acquired from the subjects used in my study, and then how the data was subsequently analyzed.
CHAPTER 3

Methodology

"Few processes are as fundamental to social science research as the person-to-person exchange of information" (Palys, 1997).

Introduction

The main purpose of this short chapter is to enable the reader to have a clear understanding of this study. It will focus on the research methods used and the data analysis. This chapter should also allow the reader to determine how relevant the study is to his/her teaching, and whether my conclusions can be used to improve the teaching of science to immigrant students from Pacific Rim countries.

As a researcher, I attempted to select a research method which was thorough and would allow me to make valid interpretations. Other issues, such as the ability of a student to make a lengthy time commitment to this study, were also taken into consideration. With these criteria in mind, I selected the in-person individual interview as the most efficient and appropriate means of collecting meaningful data for this study.

Questionnaires and interviews are very similar interactive methods. The main reason why I chose the interview over the questionnaire is that “the interviewer can ensure that the appropriate person completes the interview, immediately clarify any confusion about particular questions, and encourage verbally stingy respondents to embellish further” (Palys, 1997). The interview allows a more intimate connection between the interviewer and the interviewee, a greater likelihood of developing rapport, which could lead to more meaningful data.
The School and Participants

The participants for this study were selected from a secondary school in Richmond, a city in the Lower Mainland of British Columbia. This school has a population of approximately 800, quite small for a secondary school in this area. Despite the small number of students, the teachers of this school pride themselves in offering a wide range of academic and non-academic courses, particularly in the sciences.

In May of 2002, I submitted a request for and later received permission to conduct my study from the U.B.C. Behavioural Sciences Screening Committee and from the school board. To obtain participants for this study, I first received permission from several science teachers in the school to speak to their students about my study. I discussed my study with the students for approximately five minutes. All students who were interested in participating in this study were asked to see me at a later time. None of the students interviewed were currently enrolled in any of the classes that I taught. I felt this was very important, as I did not want any external factors to influence their involvement with this study. All participating students were required to read and sign a Subject Consent Form and have a parent or guardian sign a Parent Consent Form prior to each interview. (See Appendix for an example.)

The data for this qualitative study were obtained by interviewing twelve immigrant students from Pacific Rim countries. All of the students were relatively new to the country of Canada and had experienced some science education in both their Pacific Rim home country and Canada. The students ranged from age thirteen to age eighteen at the time of the interviews. Five male students and seven female students were interviewed. Six of the students interviewed originally attended school in Hong Kong,
four of the students attended school in Taiwan, one student attended school in Mainland China, and one student attended school in Japan.

The participants of this study will not be identified by name. The names of the students have been replaced by pseudonyms. The following table summarizes the students that were interviewed for this study.

<table>
<thead>
<tr>
<th>Pseudonym</th>
<th>Sex</th>
<th>Age</th>
<th>Home Country</th>
<th>Length of Time in Canada (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandra</td>
<td>Female</td>
<td>17</td>
<td>Japan</td>
<td>5</td>
</tr>
<tr>
<td>Erin</td>
<td>Female</td>
<td>17</td>
<td>Hong Kong</td>
<td>6</td>
</tr>
<tr>
<td>Rhonda</td>
<td>Female</td>
<td>17</td>
<td>Taiwan</td>
<td>6</td>
</tr>
<tr>
<td>Debra</td>
<td>Female</td>
<td>17</td>
<td>Hong Kong</td>
<td>6</td>
</tr>
<tr>
<td>May</td>
<td>Female</td>
<td>14</td>
<td>Taiwan</td>
<td>4</td>
</tr>
<tr>
<td>Chris</td>
<td>Male</td>
<td>17</td>
<td>Taiwan</td>
<td>4</td>
</tr>
<tr>
<td>Anton</td>
<td>Male</td>
<td>16</td>
<td>Hong Kong</td>
<td>8</td>
</tr>
<tr>
<td>Bob</td>
<td>Male</td>
<td>15</td>
<td>China</td>
<td>6</td>
</tr>
<tr>
<td>Carey</td>
<td>Female</td>
<td>16</td>
<td>Hong Kong</td>
<td>6</td>
</tr>
<tr>
<td>Curtis</td>
<td>Male</td>
<td>16</td>
<td>Hong Kong</td>
<td>6</td>
</tr>
<tr>
<td>Cathy</td>
<td>Female</td>
<td>16</td>
<td>Hong Kong</td>
<td>6</td>
</tr>
<tr>
<td>Sam</td>
<td>Male</td>
<td>16</td>
<td>Taiwan</td>
<td>4</td>
</tr>
</tbody>
</table>

Interviews

Each student was interviewed individually and privately within the school building. The length of each interview did not exceed 45 minutes. The interviews were conducted outside of regular class time, and after school hours to avoid any potential rush to another class. In order to defray the costs of inconvenience, and as a token of appreciation, each participating student received an honorarium in the amount of $10.00. The students were given the option of receiving the $10.00 in the form of a gift certificate or cash. They took place in a span of approximately six months.
Each interview was audio taped and later transcribed verbatim. Then, the transcripts were analysed for references to each of the main research goals.

The interview schedule consisted of open-ended questions that were designed to allow me to build upon and explore the participants’ responses during the interview itself. The following questions were asked during each student interview:

1. What are some of the things that you like best/least about science classes in your home country? What are some of the things that you like best/least about science classes in Canadian schools? How are the teachers different?

2. What kinds of activities in a science classroom do you think help you learn the best? Do you like taking notes, doing experiments, group activities, hands-on activities, etc.? What are some of the strategies and techniques that teachers can use to improve your learning, particularly in science?

3. What does it mean to be successful in the science classroom? Does the word “success” have a different meaning in Canada than it does in your home country?

4. Can you describe some of the things that help you to be successful in science?

5. How important is the relationship between success in science courses and your future after secondary school?

6. Have your parents’ academic expectations of you changed since you moved to Canada? Do you feel their expectations are realistic?

7. What was the most difficult part of learning science in a Canadian classroom? Does having to learn science in English make it more difficult to be successful than learning in your first language?

8. Where do you study outside of the classroom? How many hours per day do you study? What is usually taking place around you when you study? Were the study conditions different in your home country?

9. Do you think that different ethnic groups in school have different study habits in science? If yes, how would you describe them?

10. Overall, do you prefer your experience in science in your home country or in Canada? Explain.
After conducting the first two interviews, it became apparent that some of the above questions would provide the same responses. For example, I did not ask Question 4 after the first two interviews because it seemed to provide the same information as the second part of Question 1.

The responses to the first two questions were primarily used to attain information to describe the major differences between Pacific Rim and Canadian science classrooms, which was the first goal of this study. Questions 3, 5 - 7 were used to identify the characteristics of each educational system that support or do not support student success in science. This was the second goal of this study. Question 10 essentially answers the final purpose of the study, which is to determine which system of science education the students prefer overall and why. However, it became evident that the student responses to all of the questions contributed to this final goal.

Although several of the students did not have a perfect command of the English language, a lack of communication was not a large factor. If a participant did not understand a question, I simply rephrased it with simpler language. If I did not understand a student response, I would simply ask for clarification. Since most of the students had lived in Canada for at least two years, they had good communication skills. After transcribing each interview by listening to the audio tapes, it became very apparent that many of the students provided rich, detailed responses that would have an impact on this study. Other students did not provide useful information, as it was more difficult to elicit fuller responses. I categorized the responses into three sections: Classroom Environments, The Meaning of Academic Success, and Student Preference of Science Experience.
Reliability and Validity of Methodology

"Reliability implies that repeated observations of the same phenomenon should yield similar results and that different observers following the same procedures should arrive at the same conclusions. Validity means that we’re measuring what we want to measure" (Palys, 1997).

The reliability and validity of data should always be considered in any type of research. In this particular study, reliability is not a large factor; however, one would assume that the students who were interviewed would respond similarly in a similar situation.

In this study, one must not ignore the fact that the participants volunteered their time outside of regular class time, and received only a very small honourarium. Thus, one would believe that only students who truly had an interest in the topic and truly cared about the findings of this study would participate. One would think that only a small segment of the student population would volunteer their time to such a study, which could skew the results. However, since this is a qualitative study, I do not believe that this had a great influence on the final conclusions.

To conduct a more valid study, I would have interviewed a greater number of students. Second, I would have interviewed students from two or three different schools in the same city. Finally, to enrich this study, I would have conducted a second interview with the same students, perhaps six to twelve months later, in order to determine if their responses had changed over time.
Summary

This chapter described the setting, the participants, the source of data, and briefly addressed the validity and reliability of this study. The next chapter will discuss the results of the data analysis.
CHAPTER 4

Data

As mentioned in the previous chapter, ten main questions were asked during each interview of the twelve participating students. The data gathered from the student responses has been organized into three main themes: Classroom Environments, The Meaning of Academic Success, and Student Preference of Science Experience.

Classroom Environments

When one attempts to envision the environment of a Pacific Rim classroom, images of great strictness and discipline enter the mind. Perhaps these notions have been driven by the media over time. It is believed that educators in Pacific Rim countries use strictness and discipline as tools to motivate and enable students to reach their potential. One would believe that the Pacific Rim classroom is a not a place that many students would enjoy. In addition, one would think that the difficult environment would inhibit student learning, not promote it. The theory that the average Pacific Rim classroom teacher is stricter than the average Canadian teacher was reflected in several of the responses made by the students that were interviewed.

Sandra did not enjoy the “rigid” atmosphere of the Japanese classroom. “You’re just afraid to ask questions. You don’t want the teacher talking to you. That’s always bad.” She recalls her “teacher being tough. He always demanded respect and he was really strict.” Curtis remembers a very structured classroom environment in Hong Kong in which students were expected to “bow and say good morning.” Sam stated that
teachers in Taiwan "tend to want respect. If you don't respect them, there is punishments."

Some of the students indicated that Pacific Rim teachers would discipline misbehaving students in a manner that would certainly not be condoned in a Canadian school system. Sandra recalled an incident in which a student was speaking out of turn and the teacher "got really mad. He threw the chalkboard chalk at him." Erin claims that if the students were "bad, they would lock you in the room, turn off the lights." Bob stated that teachers in China are permitted to discipline students using physical force. He claims that when he was in grade 2, "he got slapped by my teacher in the face, giving me bruises on the face." He recalled that, "There was beating with rulers, constantly throwing books, constantly yelling." He stated that if a student did not understand a particular concept and the student asked a question of the teacher, the student would often be ridiculed. Bob completed his thoughts by stating that, "The teachers (in China) want total control and the way they discipline kids is just not humane."

The environment of the Pacific Rim classroom is thought of as simple and perhaps slightly old-fashioned compared to that of a Canadian classroom. The average situation might include rows of students taking notes from a strict instructor at the front of the class. I also believe that there is very little commotion or movement in such a classroom.

Carey remembers that classes in Hong Kong were very quiet and that the movement of students during class was limited. Anton recalls that the student seating plan was prearranged to avoid potential student disruptions. Students had to raise their hands if they wished to speak. In Canada, one of the first experiences that Anton recalls
occurred in grade 3, in which one of his classmates walked over to another classmate to engage in conversation. One of his first thoughts was, “Can you do that?” He stated that the atmosphere here is “open and relaxed,” which lends itself to activities such as group projects and hands-on activities.

Although most of the students interviewed believe that the rigidity of the Pacific Rim classroom is overwhelming, some students believe that the lack of structure in the Canadian classroom is not the best possible learning environment either. May believes that the teachers in Canada should be stricter.

Most of the student responses indicate that there is very little interaction between students in the average Pacific Rim classroom, which is not surprising. Sandra enjoys the greater amount of cooperative learning and interaction with classmates in Canadian science classes. Erin recalls very little interaction with fellow students in Hong Kong, resulting in few memorable friendships. May stated that there is more project work in Canadian classrooms and talking in class is permitted and often encouraged. Debra believes that students are more active in Canadian science classes. She enjoys project work, particularly skits. Curtis recalls that there was plenty of note-taking and little cooperative learning in Hong Kong.

The rapport between the teachers and students in Pacific Rim classes is poor and the interaction is minimal. Erin stated that in Canadian science classes, there is much work to be done, but she enjoys the classes because the teachers interact with the students. May believes that in Taiwan “the teachers just care about your marks” and care little about the students themselves.
However, several of the students interviewed were not overly complementary of teacher conduct in Canada, leaving me to question what we as educators can do better. Rhonda stated that Canadian teachers “don’t really push you.” She believes that her greatest source of motivation comes from other students and herself, but not from teachers or even her parents. Debra believes that the teachers are much different in Hong Kong. She stated that, “If you don’t do well in one assignment, they talk to you and give you a lecture. Teachers here don’t really care about what you do.” She went on to say that the teachers in Hong Kong are not necessarily better, but just different to their Canadian counterparts.

Anton believes that the collective attitude of teachers in Canada differs greatly from that of teachers in Hong Kong. In Canada, “Teachers focus mainly on the subjects that they teach.” In Hong Kong, they “teach you not only about your academic subjects, they also teach you more values, discipline, and respect.”

Some of these comments made by the students are one of the first indications that although these students did not necessarily enjoy the environment of the Pacific Rim classroom, perhaps they believe that it was better for them in terms of learning or their future.

I imagine that students in Pacific Rim countries work harder in the classroom and contribute a greater portion of their time outside of school to homework. Of course, this does not necessarily mean that students are truly learning, but a good work ethic is something to be admired.
Many of the students' comments reflected the large amounts of work that was necessary in the Pacific Rim classroom. Erin was quite young when she left Hong Kong, but she recalls "just writing and writing and writing." She added that, "It was really hard, and there was tons of homework." Apparently, there was little time for anything but homework. May stated that, "You don’t really have fun" in Taiwanese classes. She stated that in Canadian science classes, "You actually have fun instead of just looking at a text book." She added that there was a large amount of homework, and like Erin, stated that, "You just keep on writing and writing." Chris stated that it felt like the teachers were "feeding the knowledge to you." In Hong Kong, Debra remembers that the students take notes for the majority of the class. Anton remembers that learning felt like "trying to jam information in your head," and that teachers relied very heavily on textbooks.

The student comments would have one believe that the Pacific Rim system of education relies heavily on rote memory, although none of the interviewed students actually used these terms. Most Canadian educators would categorize rote learning as the lowest form of learning, according to Bloom’s taxonomy.

However, students such as Debra and Bob did enjoy the Pacific Rim method of teaching because of the consistency and structure of the system. The students knew what to expect from each lesson. There were few surprises, which can cause stress to many students. Chris does not like the fact that less homework is assigned to students in Canada. He agrees that this helps create a less stressful learning environment, but "long term speaking again I think it’s less helpful."

With the exceptions of Erin and Debra, who claim that they study less than one hour per day here in Canada, the students interviewed have good study habits. This is not
very surprising, as students who are willing to be interviewed for a thesis are generally motivated students. Most of the students study between one and five hours per day. Since all of the students interviewed had completed most of their high school education in Canada, it is difficult to compare the study conditions here in Canada with those of their Pacific Rim home countries. One would expect that the students interviewed would spend more time studying here in Canada because they are now at a higher grade level. Surprisingly, this was not the case for several of the students.

Some interesting comments were made by some of the students in regards to the study conditions in Pacific Rim countries. Erin is a grade 12 student who studies very little. She believes that students in Hong Kong study much more than they do here in Canada. She stated that in Hong Kong, “You go home and study. In Hong Kong, no one has an after school job, unless you’ve dropped out of school, unless you’ve graduated already.”

Some students claim that they spent more time studying in their home countries in earlier grades than they do now in Canada. May stated that she studied more in grade 4 in Taiwan than she does now in grade 8 in Canada. She added that she studied approximately two hours per day in Taiwan, much longer than she studies now. Chris stated that he did more homework in grade 9 in Taiwan than he did in grade 11 or grade 12 in Canada. He added that the greatest reason for this is that students must take a very important exam as they move from junior high school to senior high school. “The school ends about May or June because you are graduating, but the last one or two months you usually have to be forced to go to school to study, although there is no new stuff to be taught. You go to school from 7:00 am, study up to 9:00 pm. Students are fighting a war
together. You study late in the night. You go home and study as well, and study up to midnight or 1:00 am.” Chris completed his thoughts by stating that he found his grade 12 year “so relaxing” compared to the intense study schedule in Taiwan.

Bob, who just completed grade 9, stated that he spends no more than two hours per day on homework assigned by his teachers, but that his parents try to enrich his education by providing tutoring. He too claims that the amount of homework is greater in China than it is here in Canada. He stated that there was no less than four hours of homework per day, “and that was in grades 2, 3, and we were working until 4:00 am, crazy working!” Sometimes, his parents would assist him because they could no longer stand him working so late. Bob did not attend high school in China, but he believes that the homework load doubles as students move from elementary school to junior high school, and that his cousin “nearly failed high school because of the homework load.”

Anton, who now studies four to five hours per day, attended school in Hong Kong, and stated that, “They give you homework starting in grade 1.” A common practice in grade 1 would be to read parts of a textbook and copy the vocabulary terms.

Sam stated that the homework load itself in Taiwan was bearable. However, to achieve higher grades, “there would be tutors, so the tutors plus homework would be lots.”

One of the main differences between the Pacific Rim and Canadian systems of science education is the focus on lab work and activities. Research has indicated that students learn scientific concepts best when they are reinforced with labs. Most of the students, including Sandra, Erin, Rhonda, and Chris, stated that they enjoy the lab work and hands-on activities in Canadian science classes. Cathy and May stated that there is
less lab work and less cooperative learning in Pacific Rim classes. Cathy added that learning felt like, “It’s more like get to the information and put it in your mind.” Carey and Bob enjoy the hands-on activities and field trip opportunities that are offered in Canadian science classes. Bob particularly enjoys learning concepts in biology through the dissection of specimens. They appreciate the fact that Canadian teachers employ a variety of teaching styles to deliver information, instead of just direct teaching.

Chris defended the Taiwanese system of science education by stating that teachers attempt to make classes interesting, but the large curriculum prevents them from conducting more than a couple of labs in a course.

The student responses indicate that the classroom environments of Pacific Rim and Canadian classrooms are significantly different. The majority of the students interviewed seem to prefer the Canadian environment, but it is not clear which system they truly believe is best for them. The next section will look at how the Pacific Rim and Canadian cultures view the meaning of academic success.

**The Meaning of Academic Success**

A “loaded question” is one in which the person being interviewed feels the need to answer in a certain way. The person being interviewed believes that they will be frowned upon if they do not answer accordingly. When I asked the students what academic success meant to them, I felt that most students would give me responses that I would find impressive, and not necessarily truthful. I was not surprised with the majority of the responses.

Most students agree that the final percentage or the letter grade in a course does not necessarily equate to success. Erin stated that, “You have to be able to understand the
concepts, but not only understand, to be able to apply them as well.” Rhonda echoed the same thoughts. May stated the success is evident “when you understand what you’re learning, instead of just memorizing.” Chris agreed and added that project work is an excellent way of testing whether students truly understand the concepts of a course.

Carey and Anton’s definition of success is a little different. They believe that success is attained when the student is “able to develop an appreciation for sciences.” Bob added that, “If you can take what you learned in grade 8 and 9 and 10 and apply it to your life, then you are a good science student.” Sam stated that a student is successful if he/she has fun, works hard, and tries his/her best.

It was also not surprising how the students responded to the question of how success is viewed in their home countries. The student responses reflected the stereotype that success is measured according to grades. Almost all of the students interviewed believe that success is equated to student achievement, which makes one believe that there may be great truth to this stereotype.

Almost all of the students interviewed agreed that the word “success” is based on marks in their home countries. Erin stated that Canadians have the attitude that, “It doesn’t matter if you win or lose, just as long as you try.” However, “winning is everything in Hong Kong. Everybody has to be smart, everybody has to be the richest. The mindset is completely different.” Erin emphatically stated that she had to attain straight As and have the highest mark in all of her classes in order to please her parents.

Rhonda stated that “marks are everything” in Taiwan. She went on to say that many of her friends’ parents say, “I don’t care about anything, just as long as you get a high mark and get into university, you can do anything you want.” Cathy simply stated
that in Hong Kong, "Marks is pretty much the whole thing. Marks show how smart you are, how good you are in this course."

Chris agreed with all of these comments, but added that a student's mark in Taiwan is more representative of success because there are more tests and more homework.

Anton agreed with the other students in that more emphasis is placed on the mark. His proof is that in Hong Kong, students are ranked in each classroom and given awards. To receive such an award is a great honour. He believes that teachers in Canada place more emphasis on the process rather than just the final result. I believe this is true.

Bob was equally emphatic in his statements, as he believes that success in China means "top of the class." He added that, "Your grade will get you places in the school, will get you honour in the school."

Sam added that in Pacific Rim countries, it is not just students who are competing against one another, but the schools themselves.

All of the students interviewed agree that their parents' academic expectations of them have changed very little since moving to Canada. Anton stated that, "It's difficult for them to change. It's the way they were brought up. They've been through education in Hong Kong. They lived there for many years before coming here. It would be difficult to alter their perspectives on education and their expectations."

The only difference in the student responses is the magnitude of the parents' expectations. Many parents have very high expectations. Sandra's mother has made the comment, "Get As no matter what, you have to get As!" Sandra believes that this is fair because she too has very high standards for herself.
Erin stated that although her parents do not play an active role in her education, she is still reprimanded for poor results. She recalls an incident in which her mother was discussing her report card with other parents. Her mother exclaimed, “My daughter got 90%! I’m so disappointed!”

Chris’ parents expect high grades too because they believe that the class average in most courses tends to be higher in Canadian classes than in Taiwanese classes. They also realize that Chord’s marks were higher in Canada than in Taiwan when they first moved to Canada, and thus expect similar results to continue.

Anton’s parents have very high expectations of him, but he believes that their expectations have always been “one of the factors that motivates me to strive better.” He also believes that their “expectations are always attainable” and not too high.

Bob’s parents “believe in the Chinese system, which is grade-oriented.” He does not blame them for their attitude, as he realizes that his parents can only refer to a report card with “a grade and pre-inserted comments.”

Some of the students interviewed wish their parents were more demanding of them in terms of grades attained. I believe that there are two main reasons for this. One is that this is what they were used to in their Pacific Rim home country. Another reason is that they still see how other Pacific Rim parents treat their children, and perhaps desire the same treatment.

Rhonda believes that her parents do not put enough pressure on her. She believes that this is because they only speak Chinese and are not very involved in her schooling. Cathy’s parents give her much independence, as they trust she will do her best. They are content with her whether she is “getting an A or getting a B.” May believes that her
parents are a little different from average Taiwanese parents. She describes her parents as “casual” in regards to her marks, unlike most Taiwanese parents “who set high standards for their kids.” Debra’s parents afford her great freedom and rarely approach her about marks. Curtis believes that he has far greater expectations of himself than his parents do. He believes that he receives the most pressure from his friends and himself. Sam’s parents expect him to attend university following secondary school, but he realizes that if he does not succeed, it is his failure and not his parents.

It is not surprising that the great expectations in Pacific Rim classrooms create a very stressful learning environment. The competition between students in Pacific Rim countries is immense, even at a young age, and is probably not very healthy.

Erin stated that there is great pressure on the students in Hong Kong. Rhonda disliked the great amount of competition found in Taiwanese classrooms. She mentioned that many students in Taiwan commit suicide as a result of the great academic pressure. This reminded me of an incident that occurred at Steveston Secondary School in the mid-eighties. A grade 11 or 12 Pacific Rim student went missing, and his body was discovered a few days later close to his home. A suicide note was discovered, indicating that he was very distressed with his latest marks. Surprisingly, his grades were actually quite good, approximately in the B range. I now wonder who provided the greatest amount of stress to help cause this tragedy – the parents, the culture, himself, or perhaps a combination of these factors.

Cathy enjoys “living under pressure,” and she believes that there is far more pressure placed on students in Hong Kong than there is in Canada. In Hong Kong, students are marked on a curve, which creates great competition amongst students. “You
are fighting against people, competing.” She enjoys that because it forces the students to work harder than they would in Canada.

In Taiwan, Chris admits that he did not enjoy science classes, perhaps “because there’s too much homework, too much pressure, too much tests.” When speaking about the exams that are taken in Taiwan when students move from junior high school to senior high school, he stated that, “Every classroom is full of people who are your enemy.” Many students believe that if they do not have success in these exams, they will have a poor future, and that a university degree is the “basic requirement” to future success.

After listening to these student responses, I tried to determine whether the majority of the students truly dislike the great pressure of the Pacific Rim school system. I believe that although they do not like it, they believe that it might be necessary or that it helps them succeed in the long run.

The students were then questioned as to what factors would increase their success in the science classroom. Many different answers were given; some seemed obvious, others seemed a little surprising.

Not surprisingly, many of the students interviewed, including May, Chris, Debra, Carey, Curtis, Bob, and Sam, believe that labs and teacher demonstrations allow them to attain a better understanding of concepts in a science class. Sam stated that experiments “get me to see things.” Curtis simply stated that the teacher should do “more fun things!”

Others, such as Sandra and Erin, focused on the teachers themselves. They simply stated that teachers should be patient and be willing to provide assistance outside of classroom time. Somewhat surprisingly, quality direct teaching in the form of notes is also important to students. Chris stated that, “If the teacher can organize the notes pretty
well, the student has no need at all to pick up a text book.” Sam stated that he does not like taking notes, but that he “was trained well in Taiwan” and that he understands the importance, particularly in a senior science class. Cathy would like the teacher to photocopy the notes for the students, making it more efficient for learning and teaching.

Rhonda was quite specific about lesson planning. For every scientific concept, she would like one or two classes dedicated to the explanation of the theory. Then, she would like another class which reinforces the concept with a hands-on activity.

Debra and Sam, who are both entering grade 12 and will be writing provincial exams for the first time, would like the teacher to assist students with the writing of these exams by going over many previous exams. Sam added that the teacher could accomplish this by organizing fewer labs. He went on to say that he did not “think labs really matter. Labs are just there to help you visualize.”

Erin believes that “it’s really important the teacher takes their time to go through examples, explain to you, answer questions.” May believes that the teacher should be an encouraging individual who creates an atmosphere in which students are “not afraid to ask” questions. Anton believes that “teachers should do their best to try to make their students develop an appreciation for the subject and for themselves. Teachers should engage their students more, more conversations, more interaction between teachers and students.” He believes that the Canadian system of education presents “lots of potential... for teachers to be not just superiors but equals to the students. When students believe that the teacher is one of them, it is easier for them to develop an interest in that subject and ultimately do better.”
The students were then asked if attaining success in science courses had an impact to their future endeavours. Before the interviews, I was under the impression that Pacific Rim students focused more on the sciences than on the arts. I believe that most Pacific Rim families place more value on the sciences. They prefer that their children pursue science-related careers, such as medicine or dentistry, because these professions tend to be equated to prestige and financial well-being. This turned out to be fairly accurate. Most all of the students interviewed, particularly those who plan on pursuing a science-related career, agree that the relationship between success in science courses and the future after secondary school is very important. Sandra realizes that if she does not have adequate success in science courses in secondary school, she will not “be able to get into the school” of her choice. Rhonda believes that science classes “are more important (than other classes) for me.” She went on to say that she “wouldn’t care if I get a 61% on my English, but if I get a 61% in my science course” she would not be happy. May is only in grade 8 but has already decided to pursue a career in medicine. Thus, she believes that it is important to focus on science courses at the secondary school level. Chris, who is graduating this year, will be entering the Faculty of Science at U.B.C. next year, and thus believes that his secondary science success is crucial to his future. However, he states that success is not as important for students who do not intend on pursuing the sciences after secondary school.

Anton, Bob, Curtis, and Sam also believe that success in the sciences at the secondary level is important for one’s future, regardless of what career path one chooses. Anton stated that, “Science is a very big part of life with technology. It is very beneficial to have a good foundation for science.” Bob echoed those sentiments by first defining
the term science as “the understanding of how things work in nature.” He believes that “science is all around us, and understanding these things would help no matter what area you go into.” Curtis stated that science allows you to “understand more in your daily life.” Finally, Sam demonstrated his dedication to academics by stating, “It doesn’t matter what course I’m taking. I just have to work hard. It is very important to try your best.”

Before the interviews, I used to believe that many Pacific Rim-born students focused and primarily took science courses because of parental or cultural pressure. As mentioned earlier, science-related careers are associated with intelligence and success. However, several of the comments made by the students make me believe that another reason why many Pacific Rim students take courses in the sciences is that they feel comfortable in these classes. They realize that a lack of English skills may not interfere with their learning and success in science courses, as this deficiency might have an impact in courses such as English or Social Studies.

The majority of the students interviewed stated that a lack of fluency in English was the main cause of their problems when they first entered Canadian classes. May expressed her frustration in having a lack of scientific vocabulary. For example, she had already learned the different structures of the eye in Chinese. However, she felt frustrated in Science 8 when the same material was taught because “even though you understand it, you cannot express yourself.”

Chris stated that when he first came to Canada, he primarily took math and science courses because he figured “that this is one of the languages I’m familiar to use. I can read a plus sign, equal, division, this stuff is familiar to me. I feel I can
communicate with people with this language, scientific language I would say.” He went on to say that he may not be pursuing a career in science had he not come to Canada and taken a number of science classes in order to avoid courses such as “social studies, history, literature.”

Anton stated that, “The language definitely was a barrier.” He admitted to cheating in grade 3 when asked to write a report on eagles. He stated, “I had no idea how to do it because I didn’t have the vocabulary to write out the report. One of my classmates basically did the project for me. I didn’t have enough English to either read the information or to write out the notes.”

Sam claimed that he “wouldn’t understand what the teacher was talking about.” Like most of the students interviewed, he states that he must still work harder than native-born Canadian students. This is interesting in the sense that it explains why many Pacific Rim-born students tend to have excellent work habits.

I had reservations about asking whether different ethnic groups had different study habits. Although the model minority stereotype is a positive stereotype, as it states that the majority of Pacific Rim students perform very well in school, it is a stereotype nonetheless. My fear was that this was another loaded question, and that the appropriate response would be that all students, regardless of ethnicity, are the same. Surprisingly, I found the students to be very honest and sincere in their comments.

Chris and Sam are the only students interviewed that believe that there is no correlation between ethnicity and study habits. Chris stated, “You can see students from Taiwan study super hard, and study until midnight... come to school early and study in the hallway. But, you can also see students from Taiwan wandering in the hallway and
say 'Hey, let's skip class and go to McDonald's.'” Sam believes that “it all depends on you.” He does not believe that “different race will study different times.” He explained his perspective by stating that a trip to the school library will allow one to observe “different faces, different kinds of people from different countries.”

Sandra seemed tentative when responding to this question, perhaps because she too felt it was a loaded question. In fact, she changed her mind during her response. She originally took the point of view shared by Chris and Sam by stating that “it all depends on the individual. A lot of them (Chinese-speaking students) are (hard-working), but there are a lot of slackers too.” She also stated that the quality of one’s friends will influence study habits. For example, “If your particular group works harder than everybody else, then you will work hard too.” However, during the same response, she mentioned that her high school in the United States was predominantly composed of Chinese-speaking students. Compared to all the other schools in the L.A. county, the school she attended received the most academic recognition “because it was mostly Chinese, because they are more hard-working, maybe...”

The remainder of the students interviewed believes that there is a strong correlation between study habits and ethnicity. Erin stated that most of her Pacific Rim friends have tutors, and that “people who are getting 96% in math... still have a math tutor.” She believes that Caucasian parents would not “actively scout tutors” for their children. May believes that Taiwanese students study more than students of other ethnicities because “their parents have higher standards, and the parents watch over their studying, just in order to know they are actually studying.” Carey agrees with May, and added that several years of parental influence will eventually lead to high expectations for
the students themselves. Bob echoed these ideas, stating that the study methods of Pacific Rim students “are influenced greatly on the background of parents and what they have been taught in their home country.”

Anton believes that “different cultures have different perspectives on how to approach education.” He added that, “Generally speaking, families from Pacific Rim countries tend to see education as a higher priority. They try to be more involved in their child’s education. Here the parents are more relaxed on their children. It is easier because parents want to give them freedom and choice sometimes. Here they tend to slack off. The expectations here are different, so the students here are different.”

Curtis simply believes that Canadian-born students are involved in more outdoor and extracurricular activities, so they have fewer hours to study.

The majority of the students interviewed believe that the Pacific Rim culture equates academic success to high grades. I believe that most of these students believe this is also true, although they might state otherwise. The final section of this chapter will examine which science experience, Pacific Rim or Canadian, these students preferred.

**Student Preference of Science Experience: Pacific Rim Home Country or Canada?**

Before conducting any interviews, I assumed that most students would state that they preferred their education in Canada rather than in their home country. I assumed this because the environment is more relaxed, which I believed would enhance learning.

It is very important to note that although most of the students interviewed stated that they prefer one system to another, many of their comments indicate that they see
merit in both their home country and Canadian experiences. At times, their comments were even contradictory.

Most of the students interviewed seem to prefer the Canadian system of education, particularly in the short term, as it provides a less stressful learning environment for the students.

Three of the students, Sandra, Erin, and Cathy, mentioned that many teenagers in Pacific Rim countries commit suicide due to intense academic pressure. Erin claimed that, “The suicide rate of teenagers is the highest in Hong Kong.” Sandra believes that she has “learned more over here.”

Rhonda stated that she prefers the Canadian system of education because although it is slower in pace compared to that in Taiwan, it allows students to learn concepts comfortably. However, she also believes that the math-related science courses, such as Physics and Chemistry, are more advanced in Taiwan. She enjoys the challenge of enriched or advanced science classes that are offered in Canadian schools, but she believes that “in Taiwan it’s always enriched.”

May claims that she liked “nothing” about Taiwanese classes. May prefers the Canadian system because the teachers assign less homework, which leads to less student pressure. Contradicting herself, she also believes that students here in Canada should study more.

Carey prefers the Canadian system because the teachers provide more hands-on and group activities. However, she is quick to point out that “people actually concentrate more (in Hong Kong). They’re more serious so that you are less influenced to slack off.”
Anton could not answer this question fairly because he had no secondary school experience in Hong Kong. He believes that a combination of the Canadian and Pacific Rim systems would be the best situation. He stated that, "The discipline imposed in Hong Kong... tends to... give you a better foundation, but not necessarily a better overall outcome because they try to make you a self-motivated student. In Hong Kong, they just give you facts and information and they just try to jam it in your head. Here, they are able to let you explore more on your own through group work and projects and field trips."

Cathy, Chris, Bob, and Debra see the positive aspects of the Canadian system of education, but prefer that of their home countries. Cathy stated that she found the science classes in Hong Kong far more advanced than those in Canada. For example, many concepts taught in Biology 12 here in Canada were taught at a lower level in Hong Kong. She also stated that, "Studying in Hong Kong, especially science courses, you do work harder, you will be more concerned about your grades and your exams. You understand better if you work harder." Cathy concludes by expressing the opinion that, "You feel more success if you can overcome the exam. That's the challenge of it, that's the beauty of it." Chris stated that now that he is in Canada, he realizes that students in Taiwan "learn more, way more." The pace of science education is faster to that in Canada. In Physics and Chemistry, Chris stated that, "All the things we learned back in Taiwan is way beyond the stuff we learn in high school here." He claims that about half of the Chemistry 12 curriculum in British Columbia is taught at the grade 9 or 10 level in Taiwan. He believes that it is difficult to appreciate the Taiwanese system of education as a student because there is great pressure. Chris also claimed that, "In many global
competitions, like math Olympics, science Olympics, you can see that people from Pacific Rim countries usually get higher ranking than people from North America and Europe.” In China, Bob believes that the pace of science education is much faster to that in Canada. He recalls that scientific concepts that were taught in grades 6 and 7 in Canada were previously taught in grades 2 and 3 in China. However, he finds that the pace of science education in Canadian classes is a little slow. Debra contradicted herself when responding to this question. At first, she stated that she prefers the Canadian system of education “because the things are so much easier. When I came here in grade 8 math, it was like grade 4 math for us.” Then, she concluded her answer by stating that she does not feel comfortable with the ease of the Canadian system, and that she prefers to be challenged.

The overall theme of the data provided by the interviewed students is that they prefer the Canadian system of science education because it is less stressful, less competitive, and less work-intensive. However, many of the students who claim this also seem to believe that they learn more in the Asian system, and thus prefer that system. It was very interesting to note the change in attitude from one question to another while interviewing the same student.

I believe that Pacific Rim students who are now studying science in Canada believe that if expectations of them are not demanding, they will not reach their potential. I also believe that these same students feel they are not learning enough if they are not placed in highly stressful situations. The next and final chapter will deal with the contradictory thoughts of these students in regards to the Canadian system of education.
CHAPTER 5

Summary and Analysis

One purpose of this study was to describe the major differences between Pacific Rim and Canadian science classrooms as perceived and experienced by the students. Another purpose of this study was to identify those characteristics of each system that, from the student's perspective, support or do not support student success in science.

There were few surprises in regards to the differences between Pacific Rim and Canadian classrooms. The stereotypes observed by many North American educators seemed to be confirmed in many of the student comments during the interviews. Although I understand and value the concept of multiple intelligences in student learning, I found it quite surprising that different students respond to the same teaching methods in very different ways.

It is not surprising that most of the students interviewed confirmed that the average Pacific Rim classroom is a far more rigid and structured environment than the average Canadian classroom. There is a belief amongst many North American educators that teachers in Pacific Rim countries are strict disciplinarians and use this approach to motivate their students. Many believe that the Pacific Rim learning environment is not enjoyable and would thus hinder student learning. One might describe these conditions as "old-fashioned," as we have all heard tales of student discipline in North American and European classrooms from our parents and grandparents.

Most of the students interviewed did not enjoy the classroom conditions in their Pacific Rim home countries. Students such as Sandra, Curtis, and Sam often felt
intimidated by their teachers, and would often not attempt to speak in class. Other students, such as Erin and Bob, felt that teachers used inhumane methods of disciplining students, including the use of physical force and verbal insults. Some of the comments made by these students seemed very harsh when compared to the classroom conditions in Canadian classrooms. There is very little movement and very little discussion in the average Pacific Rim classroom, as described by Carey and Anton. According to many students, including Sandra and Erin, there is very little cooperative learning, and the rapport between students and teachers is minimal. May added that “the teachers just care about your marks” and very little for the students themselves.

Although most of the students interviewed believe that the average Pacific Rim classroom is far too rigid and structured, other students believe that the average Canadian classroom is far too relaxed and that most Canadian teachers are too lenient. May believes that it would be beneficial to all students if Canadian teachers were stricter. Rhonda stated that Canadian educators do not do enough to motivate their students or help them reach their potential. Debra recalls that teachers in Hong Kong would give students a lecture if they did not perform very well in a test or assignment. She has noticed that this behaviour is rare in Canada, and has interpreted it as a lack of caring. She went on to say that, “Teachers here don’t really care about what you do.” Anton believes that teachers in Pacific Rim countries have a different purpose. They do not merely focus on teaching academics, but teaching morals and values.

I believe that most students who have been in the Pacific Rim education system do not necessarily enjoy it, but feel that it was best for them, particularly in the long-term. Perhaps it is not surprising that some students feel somewhat disgruntled with the
Canadian system of education. This is particularly true of students who had success or thrived under the Pacific Rim system. It is also not surprising that the students who wished for more structure and discipline in the classroom were the older students who had been in the Pacific Rim education system for a longer period of time and became used to such conditions. Perhaps some students feel a sense of apprehension, since they had to endure harsher conditions in their home countries, and no longer have to endure such a situation. Perhaps Pacific Rim educators have instilled a “no pain, no gain” attitude in these students, an attitude which is difficult to abandon, particularly if one has experienced success under such conditions.

It is also not surprising that all of the students interviewed claimed that they worked harder in class and studied more after school hours in their Pacific Rim home countries than here in Canada. Both Erin and May stated that the average Pacific Rim classroom consisted of “just writing and writing and writing.” In addition, some students claimed that they devoted more time to studying during earlier grades in Pacific Rim countries than they do now in Canada. May stated that she studied more in grade 4 in Taiwan than she does now in grade 8. Chris stated that he did more homework in grade 9 in Taiwan than he did in grade 11 or 12. He added that he found his grade 12 school year “very relaxing” compared to the experience in Taiwan. He went on to say that he would prefer to have more homework assigned to help prepare them for the future. Bob claims that there was no less than four hours of homework per day at the primary school level in China!

Although a good work ethic is very admirable, the student comments reflect that the Pacific Rim system of education relies heavily on rote memory. It must be
remembered that memorizing is not necessarily the best type of learning, and ranks low in Bloom’s Taxonomy of Learning. Chris stated that it felt like the teachers were “feeding the knowledge to you,” and Anton added that it felt like the teachers were “trying to jam information in your head.” Cathy stated that she did few labs in Taiwan, and that it felt like, “It’s more like get to the information and put it in your mind.”

Some students, such as Debra and Bob, did enjoy this system because they were comfortable with great structure and consistency. One might call such individuals “creatures of habit,” which is neither a positive or negative characteristic. Many students perform well when they know what to expect from each lesson. Although most Canadian educators try to make their lessons as diverse as possible to fit the learning needs of a multitude of students, it must be acknowledge that consistency can be very positive for many students.

The student comments reflect that Canadian science teachers use more lab work, demonstrations, and hands-on activities than their Pacific Rim counterparts, in order to enrich student learning. It was not surprising that most of the students interviewed prefer to learn scientific concepts through such activities. They seem to appreciate a variety of teaching styles to deliver information. Some of the students, such as Chris and Sam, became used to great amounts of direct teaching and note-taking in their Pacific Rim home countries. Although they do not dislike the Canadian system of education, these students found great merit in the Pacific Rim system.

Again, it was not surprising that most of the students interviewed believe that people in Pacific Rim countries have a different notion of academic success than do
people in Canada. This part of the interview seemed to produce the most interesting responses.

Almost all of the students interviewed stated that one's final grade or percentage in a course is important, but does not necessarily equate to academic success. Several students, including Erin, Rhonda, and May, stated that true success is accomplished in a science course when one truly understands and is able to apply the concepts. I was not surprised with this general attitude, and did not expect many students to state that the final grade is the most important factor to one's success. We, as former students and now teachers, have been taught that process is just as important if not more important than the final result in learning. Our students have heard this many times, and I believe the majority of North American society believes and appreciates this idea.

In addition, one could argue that if a student attained a very high grade in a course, it is very likely that the student has proven the ability to apply the concepts. Most accomplished science teachers usually assess and evaluate students by having them apply the concepts that have been taught. As mentioned earlier, the act of memorization ranks very low in Bloom's Taxonomy of learning. I do not believe that many students could attain a high grade in a science course if they could not apply the concepts.

Once again, I was not surprised how the students responded to the notion of success in their home countries. Almost all of the students interviewed stated that people in Pacific Rim countries believe that academic success is measured according to grades. This is a very stereotypical attitude, but perhaps there is some truth to this notion. Some of the more interesting quotes were made during this part of the interview. Erin stated that Canadians have the attitude that, “It doesn’t matter if you win or lose, just as long as
you try.” However, “winning is everything in Hong Kong.” Rhonda stated that “marks are everything” in Taiwan. Cathy stated that in Hong Kong, “Marks show how smart you are, how good you are in this course.” Bob stated that in China, “Your grade will get you places in the school, will get you honour in the school.” Although most of the students interviewed stated that they do not necessarily believe in the preceding statements, teaching in a school with a high Pacific Rim population for ten years makes me believe that most students would not be satisfied with any grade other than an A.

All of the students interviewed also agreed that their parents’ academic expectations of them have changed very little since coming to Canada. Some of the parents seem a little unreasonable with their expectations. Sandra’s mother made the comment, “Get As no matter what, you have to get As!” Erin’s mother made the comment, “My daughter got 90%! I’m so disappointed!” Other parents, such as those of Rhonda and Cathy, are not so demanding in their expectations. Rhonda believes that their her parents’ poor command of the English language and the resulting lack of involvement in her schooling may be the cause of this attitude.

If one believes that that the Pacific Rim system of education values final grades more than the Canadian system of education, one must not be surprised to hear the students interviewed state that the learning environment in Pacific Rim countries is far more stressful than that found in Canada. Rhonda was one of the few interviewed students who mentioned that suicide is not uncommon as a result of the great academic pressure. Most of the students stated that they disliked the great pressure associated with attaining high grades. I believe that the North American society has embraced competition as being healthy. However, too much competition can be very unhealthy,
particularly at a very young age. Many Canadian educators are familiar with the images of young primary school children falling asleep in their desks due to studying long hours the previous day. Chris stated that in Taiwan, “Every classroom is full of people who are your enemy.”

Although the majority of the students disliked the pressure of the Pacific Rim classroom, other students such as Cathy seemed to thrive on it. Many students did not enjoy studying long hours, but many felt that it was to their advantage in the future. Similarly, I believe that many students believe that the great pressure will help them to succeed in the future, regardless of how unpleasant it might be in the present.

Finally, it was interesting to note that the majority of the students interviewed and their families place more emphasis on science-related courses than arts-related courses. This is not very surprising, as I believe that many Pacific Rim parents prefer that their children pursue-science related careers, such as medicine and dentistry, because these professions tend to be equated to success and wealth. These students agree that the relationship between success in secondary school science courses and the future after secondary school is very important. Rhonda, for example, stated that she wouldn’t care if she received a low grade in a course such as English, but if she received a low grade in a science course she would be very unhappy.

Another reason that these students focus their efforts on science courses is a lack of fluency in English. They feel more comfortable in science classes rather than non-science classes. They realize very quickly in their schooling that poor English skills might have a negative impact in courses such as English, but will probably not interfere with their success in science courses. Chris stated that he may not be pursuing a career in
science had he not immigrated to Canada and taken several science courses. His main intent was to simply avoid courses that had a heavy content of English.

Perhaps the most important purpose of this study was to determine which system of science education the students prefer and why. It is not surprising that this question cannot be answered easily. This was the final question of the interview, and the one that was supposed to draw the most interesting student responses. What was intriguing was not the responses themselves, but the way in which they answered the question.

Many of the students interviewed stated that they prefer the Canadian system of education because it provides a less stressful learning environment. However, their comments before the final question or even during the final question seemed to give rise to many contradictions. For example, Rhonda stated that she prefers the Canadian system, but believes that science courses in Taiwan are more enriched and challenging. May stated that she did not like anything about the Taiwanese system of education, yet believes that teachers in Canada should be stricter and that the students should be forced to study more. Carey also prefers the Canadian system of education, but that students in Hong Kong are more serious about their studies and work harder than students in Canada. These comments make me believe that many Pacific Rim students are struggling with the adjustment to the Canadian system of education. Although they enjoy the less stressful atmosphere of most Canadian science classes, many might be feeling a sense of guilt because they are not working as hard as they once did. It is quite natural for these students to believe that they are not learning as much if they are not working as hard. Cathy echoed these thoughts by stating, “You understand better if you work harder.”
The students who stated that they prefer the Pacific Rim system of education, such as Cathy, Chris, and Bob, spoke very highly of the Canadian system in previous questions and had many criticisms of the Pacific Rim system. Yet in the end, they chose the system that they knew best. Cathy was challenged more by the Pacific Rim system, and thus felt that she was learning more. The others feel that the pace and content of the science courses taught in Canada is at a much lower level, and thus feel that they are not learning as much.

There are several things that we as teachers can do to facilitate the transition of Pacific Rim students into the Canadian system of education. First, and perhaps foremost, Canadian science teachers must avoid the temptation of believing in the model minority stereotype. Although many Pacific Rim immigrant students do succeed in terms of attaining high grades, it must be acknowledged that many do not make an easy transition from their Pacific Rim home country to Canada, regardless of academic success. Some might be struggling with the English language. Others might be having difficulty with the content itself. Still others, like many of the students interviewed in this study, might be having an internal battle in regards to the quality of education. They may be feeling that they are not reaching their potential or learning as much as they once did because they do not have to work as hard. Canadian educators cannot ignore the comments and feelings of Pacific Rim immigrant students. We must realize that they are not immune from scholastic anxiety, and that they do not differ significantly from average Canadian students.

Second, Canadian science teachers must find similarities and common ground between the Pacific Rim and Canadian systems of education. It safe to state that both
Pacific Rim and Canadian teachers and parents want the same things for students; we want students to learn, and we want students to be successful, even if the definition of academic success may be different between the two cultures. For example, both cultures and systems value a solid work ethic. In other words, both Canadians and people from Pacific Rim countries believe that hard work will pay dividends in the future. It is very important not to criticize or disregard the methods of the Pacific Rim system of education. Most Canadian teachers would find the rigidity of the Pacific Rim classroom and the methods of discipline difficult, if not offensive. However, we must realize that these methods do work for many students, even if we would not want that type of classroom environment. A common basis of dialogue is an excellent means of helping Pacific Rim immigrant students and their parents buy into our system of education.

Third, Canadian science teachers must acknowledge the idea that the two cultures have different definitions of success. We must make it known to Pacific Rim immigrant students and their parents that to be successful in the Canadian society, students must appreciate a different approach to learning and teaching. For example, we as science teachers must continue to pride ourselves in conducting experiments and demonstrations in order to enrich the science experience. We must continue to promote cooperative learning in order to allow the students to learn to work with others. Although these strategies do not necessarily lead to academic success in Pacific Rim countries, it must be explained and proven that it is paramount in our system of education.

As educators, we must convince Pacific Rim students and their parents that it is not necessary to include large amounts of memorization in all lessons. There is not always a correlation between a large workload and learning. We must demonstrate that
our pedagogical methods are different, but proven and worthy. We must prove that these immigrant students are indeed learning, but in a different manner.

Obviously, more research must be done on this topic and more students must be interviewed to attain richer data. Perhaps this study can be used as a pilot study for others to determine how we can convince Pacific Rim immigrant students that our system of teaching and learning is neither superior nor inferior to that in Pacific Rim countries. It is merely different; in some areas, I believe much better, in others, I believe we can learn from our Pacific Rim counterparts.
References


Consent:

I understand that my participation in this study is completely voluntary and that I may refuse to participate or withdraw from the study at any time without jeopardy to my class standing.

I have received a copy of this consent form for my own records.

"I consent/I do not consent (circle one) to participate in this study."

____________________________________  __________________________
Subject Signature                  Date

____________________________________  __________________________
Signature of a Witness             Date
Consent:

I understand that my child’s participation in this study is completely voluntary and that he/she may refuse to participate or withdraw from the study at any time without jeopardy to his/her class standing.

I have received a copy of this consent form for my own records.

“I consent/I do not consent (circle one) to my child’s participation in this study.”

______________________________  ________________
Parent or Guardian Signature     Date

______________________________  ________________
Signature of a Witness           Date