TWO WORLDS OF SCIENCE: AN EXAMINATION OF AN ENRICHED AND A GENERAL SCIENCE CLASS

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Teacher Education

1993

ABSTRACT

THE WORLDS OF SCIENCE: AN EXAMINATION
OF AN ENRICHED AND A GENERAL
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This is a case study of an enriched and a general science class taught by the same teacher. The study describes the differential treatment of the two classes as a consequence of ability grouping the students. It does this by characterizing the nature of the academic work done by the students as well as the development of the classroom climate and student attitudes in the two classes. The findings shows that in the enriched class a supportive and nurturing climate developed, while in the general class an increasingly antagonistic climate developed with the development of a group of students becoming alienated from the teacher and the subject matter. In addition, the social structure created by the students in the general science class interacted with the school's placement practices in ways that created unintended consequences. Social bonding theory provides a theoretical perspective that yields

insight into why these unintended consequences developed and points towards possible ways in which a larger percentage of science classrooms can achieve supportive and nurturing climates.

ACKNOWLEDGMENTS

Many people have made the writing of this dissertation not only possible, but exciting and rewarding. I am deeply grateful to them all.

I would like to extend a special thanks to my dissertation director, Edward Smith, for all the guidance and support he has given me over the past years.

To the rest of my committee--James Gallagher, committee chairperson; Albert Cafagna; and Douglas Campbell, I extend my thanks for their support and help in bringing this work to a successful close.

And to Barbara Reeves who performed the tedious but crucial task of editing and formatting my dissertation and Cindy Erickson Davis who typed many charts and tables, I extend my sincere thanks.

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CHAPTER I

INTRODUCTION

What the Study Is about

There has been an ever-growing interest in the successful delivery of quality education to all children in our schools. This need has been brought to the forefront by educators, politicians, parents, and civil rights groups all over the United States.

The school in this study is trying to prepare students to meet the needs of our highly technological society. One of its practices is to classify students and place them separately into either enriched or general science classes. The students are classified according to their performance on a standardized reading achievement test, teacher recommendations, or parental choice.

This study examines an enriched science class and a general science class taught by the same science teacher. It describes the teacher's treatment of the two classes by focusing on the nature of the academic work given to the students, as well as the development of the classroom atmosphere and students' attitudes toward their class. Consequences enriched and general science placement have on the students and their educators are examined, as well as how the culture created by the students interacts with the placement

practices to create unintended consequences. More generally, this study examines the broader issues of tracking.

Before I did this study, I informally interviewed key teachers, counselors, and school administrators at the target school about the school's practice of tracking students. Many of these educators stated that their school doesn't track students; it merely sorts students into groups that are alike in many ways which makes teaching them easier. In fact, in one conversation, a school administrator said rather defensively, but with considerable pride, that the only reason why the school sorted students into groups was because it is in the best interest of all the students to do so.

I conducted this study to better understand the consequences of placing students into homogeneous groups and to determine whether the school's practice of grouping students was in the best interest of all the students. From the informal interviews, I found that most of the educators at this school simply believed, as that school administrator asserted, that grouping was in the best interest of all the students.

Several assumptions lent support to their belief. The first was the notion that students learn better when they are grouped with other students who are considered to be like them academically, with those who know about the same things, who learn at the same rate. This assumption was expressed in two ways: first, that bright students' learning were likely to be held back if they are placed in mixed groups and, second, that the deficiencies of slow students are more easily remedied if they are placed in classes together. A

second assumption was that slower students develop more positive attitudes about themselves and school when they are not placed in groups with others who are far more capable. A third assumption was that the placement processes used to separate students into groups both accurately and fairly reflect past achievements and native abilities. Part of this assumption, too, was that these placement decisions are appropriate for future learning, either in a single class or for whole courses of study. A fourth assumption was that it is easier for teachers to accommodate individual differences in homogeneous groups or that, in general, groups of similar students are easier to teach and manage.

A much smaller group of teachers, counselors, and administrators at this school believed that the school's practice of grouping students might not be in the best interest of all the students. Several assumptions seemed to lend support to their belief. The first was the notion that taking the brightest students out of the general classes made the general classes harder to teach and manage. This assumption was expressed in three ways: first, that taking the bright kids out of the general classes left those classes with few good student role models; second, that bright students in a class could be utilized to help slower students understand difficult material; and third, that the brighter students were usually the best behaved students and, therefore, taking them out of general classes increased the likelihood that more students who did not know how to behave would be in general classes. A second assumption voiced was that the placement mechanism used was

not accurate, appropriate, or fair because it usually resulted in high proportions of white students in enriched classes and high proportions of minority students in general classes. A third assumption was that slower students develop more negative attitudes about themselves and school when placed in groups that contain only others much like themselves.

Although there were other assumptions voiced by the educators and many educators had mixed reactions, these were the ones that I heard most often for and against the school's grouping practices. Overall, the majority of educators at this school found the practice of grouping students to be a rational, common-sense solution for teaching their diverse student population.

When I examined the research literature on ability grouping and tracking, mixed findings appeared in relation to their educational benefits. Ability grouping or tracking appeared not to produce the expected gains in students' achievement (Persell, 1977). There was a slight trend toward improving the achievement of "high ability" groups, but that was off-set by substantial losses by average and low groups.

Those studies, however, that indicated gains for the "higher ability" group appeared when the content, materials, and teaching methods were enriched for them and when they were "pushed" (Goodlad, 1960).

In general, the effects of ability grouping on self concept were also mixed. Four studies discovered that ability grouping is positively related to self-concept for "low ability" students, but

negatively related for "high ability" groups (Cowles, 1963; Drews, 1963; Wilcox, 1963).

Far more studies, however, report negative consequences for the self-concept of "average" and "low ability" students (Barker Lunn 1970; Byers, 1961; Kelly, 1976; Levenson, 1972; Mann, 1960; Oakes, 1985). Reviewing numerous other studies in addition to these, Findley and Bryan (1970b) conclude that ability grouping builds the egos of the "high ability" groups and reduces the self esteem of "average" and "low ability" groups.

As for whether the tracking placement can safely be counted as accurate or fair, the majority of the research on it was not conclusive (Cicourel & Kitsuse, 1963; Oakes, 1985; Persell, 1977; Rosenbaum, 1980).

I found that many research studies have shown the intended and unintended consequences of ability grouping and tracking on students, but rarely did they show how unintended consequences came about. It is hoped that my research study can shed some light on how unintended consequences on students occur as a result of sorting students into ability groups. Sometimes a researcher immersed in a study may find consequences of a particular practice, but finding how those consequences came about might be more difficult to see because of the lens the researcher uses for examination.

By using the interpretive lens, I may be able not only to find that particular consequences of the grouping practices come about, but also how unintended consequences come about. Just as an outsider might help me see my role as a researcher in a public

school in a sharper perspective, so I hope this study will help researchers, teachers, and administrators view the practice of ability grouping in a sharper perspective.

Why This Study Is Important

Presently, the United States is in the process of changing from an industrial society to a highly technological society. Unfortunately our educational system, science education in particular, is presently meeting the needs of only about 20% of our secondary students (Office of Technology Assessment, U.S. Congress, 1988). The result of this is that those 20%, as adults, will be able to help develop the technology and leadership needed in the new highly technological society, while the rest of the adults, who will depend on this rising technology to provide jobs and enhance their quality of life, will be unprepared to capitalize on that technology.

The National Assessment of Educational Progress (NAEP), in 1969, 1973, 1977, 1981, 1985, and 1989, provided sufficient data to show a decline in science achievement for all students. Although a comparison of the results of the second, third, fourth, fifth, and sixth assessments showed a leveling off of the achievement decline, this decline in national student achievement should be a major concern for policy makers and educators alike. It might be said that the future of U.S. technology depends upon the number of young adults adequately prepared and motivated in high school to select science courses in college and choose the field as a career.

Furthermore, specific segments of our population, students residing in urban areas, demonstrated significantly lower achievement in science than other segments of our society. Presently, urban areas track extensively. Yet to date, students residing in urban areas fall far behind all others in terms of number of students enrolled in high school science courses, number of adults employed in science related careers, and number of high school students selecting science in college and choosing it as a career.

The educational importance of this study is that it supports and illustrates how this national pattern of only a small percentage of science students preparing to capitalize on new technology is developing in one middle school. More specifically, the study illuminates how school placement policies can interact with the social culture created by students and teachers in ways that further alienate some students from science classes while nurturing other students towards science classes thus contributing to this trend.

CHAPTER II

RELATED RESEARCH

The practice of dividing students into instructional groups on the criterion of assumed similarity in ability is widespread. It ranges from assigning them temporarily to separate groups within a single classroom to setting up classes in differentiated tracks. Students may be tracked only for various subjects or for their entire range of school-based learning.

There has been more research on ability grouping than on most areas of schooling. Yet, ironically, the practice has proceeded quite apart from evidence regarding advantages and disadvantages. The findings have had some impact on national policy in other countries, especially Western Europe. However, in the United States, ability grouping practices have rarely had an effect on national policy. At the local level, it is not uncommon for schools in the same district to differ widely in their organization of groups and classes to deal with the realities of individual differences among students.

The most enlightening traditional study in recent time on ability grouping, particularly as represented in tracking, was done by Oakes (1985). The terrain she explored, namely, what transpires

in tracked classes, has not been greatly traversed. Her distinctive contribution was her description and discussion of the hundreds of classes that composed the junior and senior high schools in her sample.

Oakes' data and analyses regarding the way tracking resegregates students in racially desegregated schools reopened my eyes to this injustice. Minority students in her samples were found to be over-represented in the lower tracks, as were white children of low-income families. That is, the proportion of poor and minority students in low-track classes was found to be substantially greater than the proportion of poor and minority students in the population of the schools she studied.

Oakes' findings showed that there were clear differences between upper and lower tracks in regard to the content and quality of instruction, teacher-student and student-student relationships, the expectations of teachers for their students, and the affective climate of classrooms. From her conclusions it appeared that those students for whom the most nurtured learning would appear to be most appropriate received the least.

Another study, by Goodlad (1983), has been described as the most comprehensive of all studies in education recently done. The purposes of the study were to examine how elementary, junior high, and secondary schools interconnected with one another and to examine how schools functioned as social institutions. For eight years, 43 researchers did trained observations of more than 1,000 classrooms

in 38 schools in seven sections of the United States, representing urban, suburban, and rural areas.

When examining the practice of grouping students according to ability, Goodlad found that ability grouping tends to limit the opportunity for children in lower groups to keep pace with their peers. Goodlad's findings suggest that the upper groups experience a richer body of curricular content and that the lower groups experience more drill and rote learning, and that the gap between these groups of students widens each year.

Goodlad's data further revealed differences in pedagogy and class climate. Consistently, the practices and atmosphere of the low track classes conveyed a greater teacher reinforcement of behaving, following rules, and conforming. Consistently, students of low economic status and from minorities were disproportionately represented, had a high frequency of membership in low track classes, and had a low membership in high track classes.

Goodlad found, almost without exception, that classes not tracked into levels but containing a heterogeneous mixture of students achieving at all levels were more like high than low track classes in regard to what students were studying, how teachers were teaching, and how teachers and students were interacting in the classroom.

A more dated but comprehensive research study that helps explain what schools do to or for higher tracked students that facilitates their achievement, and what schools do to or for lower

tracked students that depresses their achievement, was done by Persell (1977).

In her analysis, she recognized context and process as important parts of education. Part of that context, she believed, consists of prevailing ideas in education. While she admitted that many educational ideas could be scrutinized, she chose to examine the concept of standardized achievement testing in relation to tracking and to analyze its validity, procedures, and consequences. In analyzing educational outcomes, most research has looked to racial or socioeconomic status differences to explain differential academic achievement. Persell thought it important to examine the problematic nature of academic achievement, since measures of academic achievement are frequently used by the educational system to make critical decisions.

Persell's analysis of the use of standardized achievement testing for tracking students found evidence from numerous studies that suggested that by virtue of their content and their administrative procedures, standardized achievement test are extremely inappropriate means for ascertaining the "ability" of lower class and minority children (Samuda, 1975; Roth, 1974; Labov, 1973; Thomas, 1973; Hawkes & Furst, 1971). Her analysis also provided evidence that suggested that the prevalent use of standardized achievement test scores for educational decisions has resulted in the misclassification and mislabeling of thousands of minority students, with the apparent additional consequences of

under education, lower teacher expectations, diminished self-esteem and increased rates of dropping out (Dunn, 1968).

The other important part of education Persell recognized was process, which consists of the educational structures of schools. The structural feature of schools that Persell examined was ability grouping and tracking. She did so because she believed that this particular structural feature of schools may significantly affect educational outcomes of students, both cognitive and affective.

In Persell's analysis of ability grouping and tracking, she was not able to find systematic evidence about the educational processes that occur in different tracks, but she found reason to believe that the curricular content, type of instruction, frequency and type of teacher-pupil interaction, amount of educational resources, and degree of "cooling out" may tend to favor higher over lower tracks (Lennards, 1969).

In addition, Persell saw educational ideas and structures as mediated by individual teachers who interact with specific pupils. Therefore, she examined the genesis, transmission, and results of teacher expectations.

To summarize her analysis of the relationship of ability grouping and teacher expectations, she found evidence from seven studies that consistently showed that ability grouping is related to teacher expectations (Williams, 1975; Keddie, 1971; Schrank, 1970; Pidgeon, 1970; Hargreave, 1967; Flowers, 1966). These studies all showed that teachers expected more from "higher" groups and less from "lower" groups, even when students have actually been randomly

assigned to those groups. Thus, grouping itself affects teacher expectations, independently of "student ability."

A recent interpretive study that helped me in my quest to make the all-too-familiar occurrences of tracking appear strange was done by Page (1987). Page's study focused on how teachers perceived regular verses lower-track students, on how the teachers defined the lower-track curriculum, and on students' reaction to the lower-track curriculum.

The public school in Page's study had talented teachers and academically-and-socially advantaged students. The school was viewed by the community as a "heavenly" place to send their children. Faculty members, too, characterized the school as "heavenly," voicing a shared tacit understanding of the school's student body and its mode of operation. The school's "heavenly" ethos was constituted in teachers' and students' perceptions and consequent enactments of roles and relationships, at the same time that it shaped their views and behavior.

One would expect a public school like this, with talented teachers, an academically-and-socially advantaged student body, and considerable resources to deal ably and equitably with its relatively small population of academically unsuccessful students, to deal successfully with their lower track students. This expectation was further bolstered because the teachers and students in the classes were not so disadvantaged as those described in other studies of tracking (Finley, 1984; Metz, 1978; Oakes, 1985; Schwartz, 1981); the teachers were experienced, generally competent,

and sometimes elect to teach a lower-track class; the great majority of lower-track students, like their regular-track peers, were white and middle class and scored on average in the third rather than the fourth quartile on achievement tests.

However, despite these material, intellectual, and social resources, Page's study showed that teachers distanced themselves from the lower-track classes, lower-tracked students dropped out at a rate that approximates that of much more disadvantaged adolescents, and the chaos and conflict in the lower-tracked classrooms resembled the "circus" reported in lower-track classrooms in imperiled institutions (Metz, 1978; Schwartz, 1981). Page's application of the interpretive approach provided insights into students' and teachers' perspective of the lower-track curriculum and the patterns of resolving classroom conflicts. The findings suggested that differentiation in public schools occur, in degree and process, much like differentiation in American society as a whole.

Another area that became important to me as I did this study was understanding the way relations between teachers and children affect the development of learning environments and how classroom climate may promote or retard learning. There is considerable evidence that differences in classroom climate do account for substantial differences in student learning. McDermott's (1977) research has suggested some useful explanations for how and why classroom relationships, one important aspect of climate, may serve either to enhance or limit student learning.

McDermott reminds us that environments that most enhance learning are those in which children are clear about what they are to do and have enough time to complete learning tasks. McDermott suggests that the relationships that are present in the classroom affect both the availability of time and students' understanding of tasks. The kinds of relationships that develop determine whether students and teachers develop what he calls "trusting relations," which are relations in which both teacher and students interpret what others in the classroom do as being "directed to the best interests of what they are trying to do together and understand." In classrooms where trusting relations exist, students will spend their time and energy on learning. Where they do not exist, a great deal of time will be spent trying to get organized and negotiating relationships. Much of the teacher's time and energy is likely to be devoted to establishing rewards and punishments to get students to attend to tasks. Much of the students' time and energy is likely to be devoted to not working and to disrupting what the teacher is attempting to do. If McDermott is correct, his propositions go a long way toward understanding the importance of relations between teachers and students and their impact on learning.

McDermott's conceptualization of trusting relations and their impact on learning seems reasonable. But how does a teacher develop these trusting relationship so that order is achieved in the classroom and all inhabitants of the classroom trust one another and cooperate in the learning enterprise?

How order is achieved in societies is of central interest to sociologists. Nowhere have sociologists exercised that interest more actively than in the study of conformity and deviance among children. Sociologists have produced several different theories. Schools occupy a central place in recent attempts to integrate some of those theories.

Sociologists have found that delinquent behavior (for my purposes, disruptive behavior) results from the interaction of a developing child with his social environment. The pathway to delinquent behavior is influenced by experiences in the family, at school, and in the community. Apart from prior delinquent behavior, association with delinquent peers is the strongest predictor of adolescent delinquent behavior (Elliott, Huizinga & Ageton, 1982; Hirschi, 1969; Weis & Hawkins, 1981).

Although there are disagreements about how and how much school experiences contribute to "becoming delinquent," several assumptions appeared warranted by the available evidence as a basis for interventions which seek to prevent delinquent behavior. Weis & Hawkins (1981) viewed the evolution of delinquent behavior from a developmental perspective. From their developmental perspective, the researchers argued that school experiences themselves are likely to influence the extent to which a youth will develop social bonds of attachment and commitment to conventional (socially acceptable) activities and conventional persons. Furthermore, if the process of developing a social bond to conventional activities and conventional persons has been interrupted by poor school performance, or by

uncaring or inconsistent educators, youths are more likely to come under the influence of peers who are in the same situation and are also more likely to be influenced by such peers to engage in delinquent activities (Hawkins and Weis, 1981).

This developmental view of delinquency has been integrated into a theory of delinquency and its prevention, the social development model (Hawkins & Weis, 1981; Weis & Hawkins, 1982). This theoretical model seeks explicitly to serve as a basis for delinquency prevention interventions. The researchers described stages of development and identified intervention approaches which would appear appropriate at each stage.

The social development theory identifies three general conditions which appeared to be necessary in the formation of a social bond. These conditions are opportunities for involvement, skills, and reinforcements. The social development model of delinquency and its prevention posits that social bonds are developed in school when youths have the opportunity to be involved with others in activities and interactions in these settings, when they have the skills necessary to perform competently in the activities and interactions of the settings, and when they experience consistent rewards or reinforcement for their involvement in those activities and settings. Thus, it suggests that when youths experience opportunities for involvement in the conventional activities, when they are given the opportunities to develop the requisite social, cognitive and behavioral skills to perform as expected in those activities, and when they are rewarded

consistently for adequate performance of those activities, they will develop a bond of attachment to subsequent conventional activities, a commitment towards conventional persons, and belief in the school. The formation of social bonds to school will decrease the likelihood that youths will develop attachments to delinquent peers. When these three conditions are not present in the school, a bond to school is not likely to develop. Thus, the likelihood that youths will develop attachments to delinquent peers is increasing, and, apart from prior delinquent behavior, association with delinquent peers is the strongest predictor of adolescent delinquent behavior.

In this study the social development model was used to explain the development of social bonds between the students in the two science classes and their teacher. I also used this model to explain how the students' science classroom experiences contributed to the process of "becoming disruptive." I will be seeking to identify the combined and, where possible, individual conditions; to see the extent to which these conditions led to increased opportunities, skills, and reward; the extent to which these conditions generated increased social bonding to school and conventional persons; and the extent to which these conditions were successful in reducing disruptive behavior in the science classroom.

CHAPTER III

METHODOLOGY

The Community

Loran is a metropolitan city located in the center of the state. It is an industrial center and has a population of about 150,000. The south side of the city is the most heavily populated, as it lies closest to the main automobile factories. Here homes tend to be modest, on small lots, and mostly 20 to 30 years old. Many of the homes tend to be the one-story ranch types. The school in this study is located on the southwest side of the city in an area characterized as "blue collar." In using the term blue collar, I am referring to students born into families whose parents worked in automobile-related factories. To the east of the city lies another major residential area, with a character somewhat different from the residential area to the south. The eastern area tends to be less blue collar in nature, partly because of the university located near this area.

Politically, voters in this city have never been known to favor candidates supporting social change; rather, they favor more mainstream, "bread and butter" issues such as jobs. In general, the city is thought to be somewhat conservative, although not of the

extreme variety. Seekers of public office, therefore, have emphasized the traditional issues of the working person and commercial and industrial growth that would bring jobs into the area.

The School

Loran Middle School opened in 1963. Located on a generous portion of property (23.44 acres) in the populated southwest side of the city of Loran, it serves all middle school students (approximately 1,000) who live in the southwest corner of the city, between by the city's two main freeways. Loran Middle School is surrounded by residential homes. The grounds surrounding the school are well kept, and the building itself is in top-notch condition, considering its age and the number of students who daily scurry through the halls, slam lockers, flush toilets, eat in the cafeteria, and sit (and sometimes write) on desks within the classrooms.

The floor plan of the building, which is a two-story structure, was conducted by a special committee of citizen and teachers. Their ideas were incorporated into the functional design rendered by the architects and the school administration. Materials in the building were selected for easy, economical maintenance and for their durable qualities. The floor plan allows hallway traffic to flow easily, and most corridors are double-loading. The administration and counseling area is located near the main entrance to the building.

Location of special areas was planned to make maximum use of hallways and entrance ways and also to control sound in the building from the gymnasium, shop areas, cafeteria, and music rooms. Facilities are provided in this building for a middle school curriculum appropriate to the present, and the design is sufficiently flexible to allow curriculum change in the future. Special instructional equipment is included for particular programs such as foreign language, industrial arts, homemaking, music, art, audio-visual instruction, and science. Ample general classroom space is available for instruction not requiring special equipment.

To understand Loran Middle School, one must understand the principal, Mr. Bird. He has been principal since 1981. Before that he had been a principal at one of the school district's other middle schools and, before that, an assistant principal at one of the school district's high schools. He has also been a counselor and a biology teacher. He attended college at West State College where he received a Bachelor of Science degree. He then attended State University for his Master of Arts degree and did further graduate work in administration and education. All in all, Mr. Bird has been in teaching and school administration for 22 years.

The staff describes Mr. Bird as an easy-going person, although there are time when they feel that he is direct and imposing. His staff and the students call him "Mr. Bird," perhaps symbolizing the distance he tries to keep between them and him.

Mr. Bird does not like to make all major decisions himself. Instead, he stresses staff and administration consensus in making

major decisions. Mr. Bird does try to stay informed about everything that goes on in the school. He goes to as many departmental meetings as he can. In fact, Mr. Bird stressed two key signs of a well-run school are good discipline and being aware of what is going on in the classrooms.

Almost every day, one can find Mr. Bird in the lunchroom or in the hallways directing students. Also before school and after school, he is in front of the school directing students and watching their general conduct as they unload from and load on to buses.

Mr. Bird doesn't exactly welcome change, but he is not a person who fights change either. He knows that change is inevitable and so tries to keep aware of current trends so that he can direct change in a positive manner. Mr. Bird rarely interfered in the day-to-day activities of teachers. His opinion was that teachers should be regarded as professionals and be given the autonomy of a professional to make instructional decisions within their own classrooms. Most teachers conceded that Mr. Bird ran an efficient school that normally supported change and the teacher's best interest. In these respects, then, Mr. Bird was looked upon as a good administrator.

About 60 teachers are under Mr. Bird's supervision. The teaching population could best be characterized as being stable and local in origin. The majority of these teachers do not live in the city per se; they do live in the greater Loran area. The average teacher has been teaching at Loran for 15 to 20 years. Half of the staff had received their Bachelor's degrees from State University

and the other half from a local, privately-supported college outside the area, yet still within the state.

Mr. Bird spoke highly of his faculty as a whole, acknowledging that many of them were "traditional teachers." This pattern of teaching was somewhat strange to me, since a large university with an innovative instructional program was located within ten miles of the school. In fact, I expected to find some things being done differently from time to time here, but by in large I found that the school operated very much like the middle school I had attended.

The Target Teacher

Mr. Johnson is an average-sized man in his late fifties, rapidly approaching retirement age. He has been teaching for 30 years and has been employed at Loran since 1964. He has taught mainly science-related courses during that time. Mr. Johnson's major field of study as an undergraduate was biological science. He, too, attended State University where he earned a Bachelor of Science degree in biology.

Mr. Johnson's daily teaching routine included teaching two enriched science classes and two general science classes. He is also the department chairperson, which gives him a lot of other responsibilities besides teaching. He is on numerous committees and is an active member of the school's improvement team. In addition, Mr. Johnson has worked with members of the University for about ten years. The work includes having student teachers come to his classroom for about a week for some valuable experience

micro-teaching. Obviously, Mr. Johnson is a very busy but dedicated teacher who readily admits that around March or April, he starts to get burned out. Yet in all the conversations I have had with him, I could tell he really enjoys his work.

Mr. Johnson is regarded highly by his peers as an excellent teacher. His approach to teaching science is hands-on for the most part. He tries to vary the activities that he gives students so they don't get bored; for example, one day he might have them work on a hands-on laboratory project, the next day he might take them to the library to work on a research project, the next day he might have them work out of their science book, and so on. Mr. Johnson also believes in giving students extra credit, but he is hesitant to give it to students who he feels can't take the extra work.

Entry Negotiations

Gaining access to Loran was really not difficult because my academic advisor has done work there for the last ten years. He negotiated my first visit, and I negotiated subsequent visits. Initially, my academic advisor introduced me to Mr. Bird and requested that I be allowed to do my research study there. Mr. Bird gave me his permission but he made three demands. First, I had to get the permission of the Loran School Board. Second, I had to get the permission of the teacher I was going to work with; and third, teachers, students, and parents should be told about the study before I started. I agreed, and after that, I discussed my plans

with Mr. Johnson who agreed to give me access to his classroom and his students.

A week later I wrote a letter to the Loran School Board, requesting permission to do the study. They asked me to fill out a form and submit a copy of my research proposal to them, which I did. Within a week's time, they gave me a positive response. I also submitted a copy of my research proposal to the University Committee on Research Involving Human Subjects for their approval, which was granted.

Having obtained access to the school, I had no problem getting access to the students. Mr. Johnson simply introduced me, after which I explained my purpose for being there and the scope of the study. I then handed out permission slips which the students and their parents signed and returned to me. The students and their parents were very cooperative; I had no problem with them at all. However, one thing that I sensed was school personnel appearing defensive. Many times office secretaries gave me a look that appeared to say to me, you're invading my space. On reflection, I think this might have been because they were not used to having a stranger in their school building with unlimited access to certain things. What I mean here is that Mr. Bird and Mr. Johnson gave me permission to any documents except ones that contained confidential information about the staff. This meant that many times I was forced to be in the school secretary's office, and secretaries can be very protective of files.

I negotiated access to observe two classes with Mr. Johnson. One class was a seventh-grade enriched science class and the other was a seventh-grade general science class. In order to be in the enriched science class, students had to share some common characteristics: they scored 90% or above on the reading part of the Stanford Achievement Test, or they were recommended by their sixth-grade science teacher to this class, or their parents insisted that they be placed in this class, although admittance to this class was rarely done by parental insistence alone. The general science students consisted of all the other students not fitting the aforementioned requirements.

Data Collection

The site of the study was a racially, ethically, and linguistically mixed Midwestern, inner city, public middle school. The two science classes under investigation were observed in their natural setting for one year.

This study is in the qualitative, case study tradition. Central to such studies is the goal of understanding the activities and perspectives of the participants in context with the meanings they constructed. Therefore, this research asked fundamentally different sorts of questions than those asked by standard statistical research on teaching and learning. Questions such as, "What are the conditions of meaning that students and educators create together?" Through this interpretive point of view, I hoped

to gain insight into both the effects of the differential placement to science classes and how those effects came about.

In this study participant-observation fieldnotes were used to record what was happening in the setting. Interviews of participating students and their parents, teachers, and administrators were conducted on a timely basis. Finally, documents of varying sorts and, to a lesser degree, questionnaires about classroom life were administered to many participating students. All these items were analyzed and used to interpret the contrast that existed between the two science classes. This combination of qualitative and quantitative data led to greater confidence in the findings and to richer insights into classroom life than would have been possible using either data source alone.

Also, a unique methodology was used to ensure accuracy of sequences of events and to ensure the target teachers' perspective was included in the study. The target teacher and I sat down and analyzed my fieldnotes of particular events. The target teacher then helped me fill in any missing gaps in those sequences of events. Finally, the target teacher was given the opportunity to write a section that discussed his perspectives and perceptions of the findings of the study. I felt that this was important to include in order to be sure the target teacher's sense of dilemma about these situations is accurately portrayed and to show how teachers are struggling with this practice of ability grouping.

CHAPTER IV

EXPLORING THE TWO WORLDS OF SEVENTH GRADE SCIENCE AT LORAN

Overview of Chapter

This chapter will examine some of the key differences between the enriched and general science class that were present at the onset, and that developed over time. A major part of that will be the relationship that developed between the teacher and the students in these two science class, and the intra-class culture that developed between the students within each individual class. How the school personnel perceived the two classes, and what actually happened in the two classes that contributed to the personnel having to develop strategies for handling certain students will also be illuminated.

How This Study Began

The typical day in Mr. Johnson's enriched science classroom begins with a loud, high-pitched electronic bell that screams throughout his classroom. It signals time for class to begin. The class starts as students wait while Mr. Johnson takes attendance and then gives the instructions for the day. Following these instructions, the class settles down, and students begin the work

which Mr. Johnson has planned for that period. The bell rings again at the end of the 55-minute period, and these students flood into the halls en route to their next class. Within five minutes a group of general science students enters Mr. Johnson's classroom, ready to start their science class, and the process repeats itself. To an observer, the students' class time seems fairly similar. But what is beneath this veneer? We shall soon find out when we begin our journey into the two worlds of science at Loran. Before we begin this journey let me back up a bit and give some background as to why I asked the question, "What is beneath this veneer?" The last 11 days of the previous year, I had the opportunity to observe another Loran science teacher, Mr. Thomas, in his enriched and general science classes. As a result of that opportunity, I did a pilot study for this dissertation. Reflecting back to that pilot study, this is how it began and what I concluded.

It was the last few weeks of the school year and my first visit to Mr. Thomas' classroom. I arrived 35 minutes before the start of Mr. Thomas' first hour enriched science class. As I walked in the doorway of Mr. Thomas' classroom, I had no idea of what was in store for me. I quickly surveyed his room. It was like any other science room I had ever been in. It had desks in the front, laboratory tables in the back, a couple of chalkboards and a few bulletin boards. Mr. Thomas' desk sat in the front of the room off to the side. In the rear of the room, there was a demonstration lab table and a door that led into a smaller back room.

As I walked into the classroom, I was greeted by four other teachers standing in the back room. They were drinking coffee and talking to each other. One of the teachers was Mr. Thomas. He introduced me to the other teachers and briefly explained my purpose for being there. The other teachers began making humorous remarks about my "soon to have" relationship with Mr. Thomas and his students. One of the remarks came from Mr. Johnson, another seventh grade science teacher. In a teasing manner, Mr. Johnson said to me with a chuckle, "You'll have a good time sitting in on Mr. Thomas' classes. Yeah, his enriched classes are all right, but watch out for his general classes; he has got some real interesting characters in those classes."

Mr. Thomas smiled and nodded his head in agreement, his eyes seemingly confirming the story, "You're right about that. In my enriched classes, I've got some real good kids. But, I don't believe that a lot of the kids in my general classes are really with it," Mr. Thomas said with a worried look on his face. He turned to me, put his hand on my shoulder, and said, "Maybe that will be a place you'll be able to help me with?" I nodded my head yes, but I'm sure my face showed my reluctance to this challenge.

Mr. Johnson then volunteered, "And if you don't see enough in Mr. Thomas' classes, then come to my classroom sixth hour; you'll see some more interesting things." Mr. Johnson's gaze shifted from me to Mr. Thomas. He continued, "The kids in that class are just terrible. I have five special education students and fifteen Title III students. You know I have Eddie in that class?" Mr. Thomas

shook his head sympathetically. Knowing that I wouldn't know what Mr. Johnson meant by this last statement, Mr. Thomas leaned towards me and whispered, "Eddie is a kid that has been age-promoted; he'll be driving to school next year" (Fieldnotes 5/27/89).

Over those next 11 days, I observed all of Mr. Thomas' enriched and general science classes. From what I could tell, things looked complex but well orchestrated. All of Mr. Thomas' classes appeared to go through the same identical routine steps every day. Students listened to lectures and participated in discussions, they read chapters in their textbooks and answered questions at the end of some chapters, and they filled out worksheets and puzzles. Even the occasional confusion seemed to be routine and identical. With only slight variations, events in Mr. Thomas' seventh grade science classes over that period appeared the same for every science class. But were they? Maybe yes, maybe no; I wasn't sure.

From the findings of my pilot study I concluded that there were some observable differences between the enriched and general science classes. There was a difference in the racial compositions of the enriched science classes versus the general science classes. There was a difference in the dress of many of the students in the enriched science classes versus the students in the general science classes, and there was a difference in the behavior of many of the students in the enriched science classes versus the general science classes. Although none of these differences appeared significant, over the summer that followed I kept thinking about my observations of Mr. Thomas' classrooms. I felt that I wasn't there long enough

to really understand what was going on there; however, my observations, along with the four science teachers' comments, really set the stage for this present study. I wondered what the four science teachers' comments really meant. Were there covert differences between enriched science classes and general science classes as well as the observable differences I had found? Were the observable differences I found one-time occurrence or could I find the same overt differences next year?

That following school year I would be starting my year-long dissertation study. Luckily, I was able to make arrangements with Mr. Johnson to observe his third-hour enriched science class and his fourth-hour general science class for the entire school year. Hopefully, I would be able to see what was going on there. Then I could answer the question, "What is beneath this veneer?"

My questions for this study are the following: "Are there differences in the experiences of an enriched science class student versus a general science class student? And if there are differences in their experiences, what are those differences? How are those differences perceived by the students, the teacher, and perhaps by others in the school environment? How do those differences play themselves out in the lives of the students? What is the significance of those differences?"

Comparison of Enriched and General Science Classes

In this section several differences between the enriched and general science class will be illuminated by comparing the two

science classes. These differences will range from observable differences between the two classes, to un-observable differences that can only be seen by careful observation of the two classes over time. The teacher's strategies for negating some of these difference and his sense of dilemma will also be illuminated.

Observable Differences Between the Enriched and General Science Classes

The next school year, Mr. Johnson taught both a third hour enriched science class and a fourth hour general science class. As I began my observations of Mr. Johnson's classes that year, I kept the findings from my pilot study and the four teachers' comments firmly in my mind. Within a short time, I was able to see the same observable differences between the two classes that I had seen in my pilot study. The most overt difference I noticed was in the racial composition of the two classes. The enriched science class contained 30 students, of which 21 were white, 8 were black, and 1 was Asian. The number of students in the general science class, on the other hand, appeared to vary from week to week because students were continually being added or dropped from the class list. The first week of class there were 30 students of which 21 were black, 6 were white, 2 were Hispanic, and 1 was Asian. I have to admit, because of these unequal proportions of minority students in Mr. Johnson's enriched and general science classes, I began to have ill feelings about the school's policy of having one class labeled enriched and the other labeled general. Being a minority myself, I felt that this was just another case of racial injustice. In a

study that I had read concerning ability grouping, minority students were found to be in disproportionately large percentages in the lower groups (Oakes, 1985). This haunted me constantly over the next few visits to Mr. Johnson's classroom. However, after awhile, with the help of my research advisor, I was able to step back and re-evaluate my feeling. I decided to expand my analysis and look for other differences between the two science classes.

The next difference appeared to be in the personal appearance of the students in the two classes. The students in the enriched science class for the most part dressed conservatively. For example, in the enriched class it was common to see boys in blue jeans and sport shirts and girls in designer jeans and blouses with a few in dresses. Contrast this with the dress of many of the students in the general science class. In the general class it was common to see boys and girls in T-shirts and sweat pants. Although on occasion jeans and sport shirts were worn by a few of the boys in the general class, and designer jeans and dresses were worn by a few of the girls in the general class, this mode of dress was not that common. Street jackets and coats were also worn by a few members of the general class, especially by black male students. This was noteworthy because I found out later that wearing a street jacket or coat while in class was against the rules of the school, a rule that Mr. Johnson rarely enforced because he felt that he received little backing for enforcing it from the school administrators.

When I tried to make sense of this difference in personal appearance of the students in the two classes, two ideas came to

mind. The differences might relate to the socioeconomic status of the students or they might simply be personal preferences that the students had for dress. Unfortunately, my data does not allow me to resolve this issue.

Differences in Perceptions Held by Staff Members

Another difference between the students in the enriched science class and the students in the general science class appeared to be related to how school staff members thought about the students' academic capabilities. Mr. Johnson alluded to this difference when he said to me, "My third hour enriched science class is made up of students who are among the best in the school. Now my fourth hour general science class; they're a different story. Many of them can't read" (Fieldnotes 9/15/89). I would find out soon that other members of the schools' staff shared this same perception.

It was just a few weeks into the new school year. As I sat in Mr. Johnson's third-hour enriched science class, hoping for something interesting to happen, I observed a female staff member enter the room. I found out later that she was one of the assistant principals at Loran. She came into the classroom, spoke briefly to Mr. Johnson, then announced to the class, "As many of you know, I'm Ms. Powell. This year I'm in charge of the 'Student of the Week Program.' How many of you know what the Student of the Week Program is?"

Almost all of the student in the class raised their arms and waved their hands. Ms. Powell paused for a moment and the room got

deathly quiet. Ms. Powell smiled and said, "Oh, I can see, this is a special class, a class that realizes the importance of hard work." As Ms. Powell spoke many of the students' head gestures showed their agreement with her statements, "How many students here have already been student of the week?" Ms. Powell asked. Seventeen of the students raised their hands. I was really surprised and so was Ms. Powell. She asked, "This is an enriched class isn't it?" The students responded by saying, "Yes" in unison. Ms. Powell nodded her head, smiled and said, "I see."

Ms. Powell then introduced Erin, a student in Mr. Johnson's third hour class, as the 'Student of the Week' and read a letter about Erin's accomplishments. Afterwards, the class gave Erin a big round of applause. Ms. Powell said to the class, "If any of you students would like to start a folder with things such as letters of recommendation, student of the week awards, and other things that show that you are an outstanding student, see me and I will help you with that. Remember, if you start a folder, it may help you get a scholarship to college later on down the road." Ms. Powell thanked Mr. Johnson and the class and then exited (Fieldnotes 9/20/89).

As I sat in Mr. Johnson's class that day, it struck me how Ms. Powell and Mr. Johnson felt about these students and their academic capabilities. These educators appeared to define the students in terms of the group they were in (enriched verses general). When I asked Mr. Johnson about the assumption I had made he agreed with it. Although he included that as much as possible, he also defined the

students in terms of what they did in his class. This made me wonder if this view was also shared by other staff members as well?

To find out, I had interviews with a few key educators at Loran. One of the educators interviewed was Mr. Bird, the school's principal. Below is an excerpt of that interview.

R: So do your enriched students seem to have more success in science than your general science students?

B: Well the enriched students first of all are the top. They are the ones with the test scores in the 90's on the Stanford Achievement tests. So you are talking about the cream of the crop. They typically do well in everything. Math, reading, science.

R: A student becomes an enriched science student by just the test?

B: Yeah that is probably the main factor that we use. It is also based on teacher recommendations, but typically we use the reading test score and teacher recommendations, but first and foremost I would say the reading test score to determine whether. We don't have enriched science at the sixth grade level, so it really based on their science grade in sixth-grade and their reading test score.

R: If a parent came in and strongly wanted their kid to go into enriched, no matter what the score was, then what?

B: It has happened infrequently. We do know this too, that sometimes kids don't test well, but the parent does have the final say as to whether or not the kid is placed in enriched science.

R: What have parents said about their kid being in enriched or general science classes?

B: Some parents really lobby hard to get their kids in enriched, sometimes their kid is in enriched and the parents will come in and say "I would rather have my kid go back to regular class." I think that the reason that we continue to have enriched classes, though when we changed over to a

middle school the recommendations of the committee setting up these schools was that we do away with enriched classes. We did have a group of parents who lobbied intensely to make sure that all the middle schools have enriched classes.

R: Can you tell me a little more about that?

B: Well, that is kind of a status symbol among some parents. If you put the letter "E" on it for enriched as opposed to a regular class. Just like in High School, if the kid is taking advance placement courses rather than a regular course, there is a certain added status to it. We have them because parents are a big component of the school community and we ought to take into consideration their wishes.

R: So, how about the Loran School Board, did they say have it or don't have it, or is that a decision that they make?

B: The School Board itself was not involved in the initial recommendation in terms of the choice.

R: So that is something that was local to this school?

B: Yea, because we were the first school to become a middle school. So in that sense it was but since the other middle schools all have enriched classes so it is city wide.

R: Could you explain more about how the parents got together and lobbied for enriched classes?

B: When the recommendation became that there wouldn't be enriched classes, a group of parents got together and went to the Superintendent and said that they wanted to have enriched classes, and he in conference with the group and made a decision and enriched classed are here.

R: How long ago was that?

B: About 1983 I think (Interview conducted 4/11/90).

As you can see from this interview, Mr. Bird appears to define the students in his middle school in terms of the classes they are in (enriched verses general). He perceives the enriched students as

the cream of the crop. He feels this way because of the scores certain students were able to achieve on a standardized reading achievement test, even though he acknowledges that some students might not test well. It also appears that one reason why this school has continued the practice of providing both enriched and general classes, despite the recommendations of the committee setting up these schools to do away with enriched classes, was because a influential group of parents lobbied for it and the Superintendent of this school considered their request and decided in their favor in an attempt to show that parents are a big component of the school community.

Another educator that I interviewed was Mr. Jordan, one of the schools' counselors. Below is an excerpt from that interview.

R: One day I was in Mr. Johnson' enriched classroom and one of the assistant principals came into the classroom to speak to the students. One of the comments that the assistant principal made was, "Oh, I can see, this is a special class, a class that realizes the importance of hard work. This is an enriched class isn't it?" My question to you is; Is there a message sent to enriched science students by the administration, teachers, or counselors that is different from the message that is sent to general science students?

J: Not on purpose, but I think the message is clear. Research has proven that expectations of youngsters are altered greatly by perceptions of adults in the school. That is part of the whole question; Are these enriched classes a good thing? Maybe they are not, primarily because of the messages we are sending to kids. We expect less from them because they are in a general class and indeed some of those situations happen here. In enriched classes you see experiments going on. You see kids out there doing things because they are "responsible." They can take care of equipment. They work on their own. You go to a general class and maybe a third of those kids at

> least come from a dysfunctional home situation or a situation in which they haven't learned self discipline. They haven't learned self control. Try to do an experiment with those youngsters and it is different from a teacher's point of view. The questions becomes; can those kids in general classes be taught to be responsible in those situations? There are some kids that cannot. Now, if you had those enriched kids or what we call the talented youngsters back in the classes with everybody else, would they influence the atmosphere of that class (through role models or peer pressure), such that the other youngsters would learn from them? Some research suggest very much that they could (Interview conducted 5/11/90)

Mr. Bird's interview provides evidence that seemed to suggest that other educators, other than Mr. Johnson and Ms. Powell, share this perception about certain groups' academic and behavioral capabilities. These educators appeared to define the students in terms of the group they were in (enriched verses general).

Mr. Jordan's interview appears to be critical of placing students in academic categories such as enriched and general. He calls into question the merit of having enrichment classes, primarily because of the messages it sends to students. He admits that educators at Loran tend to expect less from students in general classes and that this may have a pronounced effect on these students. He wonders if having enriched kids or what we call the talented youngsters back in the classes with everybody else, could influence the atmosphere of that class (through role models or peer pressure), such that youngsters could learn from each other?

This controversy raised an interesting question in my mind. The question of whether the students in the two science classes were really different at all, or were they just perceived by their

educators to be different? At this point I couldn't answer this question. In addition, I wondered about the students who didn't fit nicely into the categories set up by the their educators. What are the consequences for these students?

Introduction of Target Students

I was not surprised that Erin had been chosen student of the week. By what I had seen, she was very articulate and appeared very academically oriented. She seemed involved in every lesson, frequently asking relevant questions; and when called upon by Mr. Johnson, she usually responded with intelligent answers.

Erin's closest companions in the class were Concetta and Theresa. Concetta was very articulate, too, and, from what I could tell, very academically oriented. She always appeared to do more than what was expected of her in class. Theresa, on the other hand, was more social, although she, too, appeared very academically oriented. I came to see Erin, Concetta, and Theresa as typical examples of the students in Mr. Johnson's third-hour enriched science class; thus, they became members of my target group for this class.

I also felt it useful to include Marty as a target student for this class. He represented a contrast between the typical enriched science student model that Erin, Concetta, and Theresa represented. Marty was more outgoing than either Erin or Concetta and did not always participate in class work as actively as did Erin, Concetta, or Theresa. He appeared content to "just get by."

In Mr. Johnson's fourth-hour general science class, Dan was one of the more popular boys. Dan appeared to be sort of the class-clown type. He didn't appear to be academically oriented much of the time, although he did speak out a lot during class discussions. Dan appeared to have a strong influence on some of the other students in Mr. Johnson's fourth-hour class. Although these students did not follow him blindly, Dan usually set the pace for most of the clowning around that occurred inside this classroom.

Dan's closest friend in this class was Sam. He didn't appear to be academically oriented much of the time, either. In fact, he seemed to take pride in the fact that he was in a remedial reading class.

Karen and Steve were more peripheral to Dan and Sam. Karen and Steve appeared to be more academically oriented than Dan and Sam, yet at times, they did not participate in class work. Instead, they sometimes participated in clowning around in class; usually after Dan had prompted it.

Mary was one of the hardest working students in the general class. Unlike Dan, Sam, Karen, and Steve, she appeared to be very academically oriented. In many ways, she reminded me of Erin. She was very articulate and well behaved.

These five students represented a cross section of students in Mr. Johnson's fourth-hour general science class; thus, they became members of my target group for this class.

While the present study is more interested in what happens in different science classrooms as a whole rather than in individual

students, it cannot be forgotten that characteristics of individuals in classes contribute considerably to the classroom environment. This is why this study revolved around how these target students interacted with each other and with Mr. Johnson, how they thought about things, and what they shared together as members of their respective science classes.

These particular target students were selected as the study progressed, and my rationale for selecting these students grew out of my identification of social groups within the two science classes. The enriched science class didn't appear to have separate social groups. Erin, Concetta, and Theresa along with the other members of this class appeared to share the same collective understanding of what being in an enriched science class signified. That understanding included the idea that they were good in science, enjoyed working hard, enjoyed challenges, receive good grades, and followed classroom rules. Marty was selected because he didn't appear to share all of these beliefs. He didn't appear to enjoy working hard and the idea of always following classroom rules didn't appear to set well with him either.

In the general science class there appeared to be three different social groups that each had its own collective understanding. Mary represented the group of students that worked hard in science class and in many ways shared the same understandings that enriched science students shared. Dan and Sam represented the group of students that appeared to shared an understanding that was the complete opposite of the group that Mary

represented. From my observations they did not appear interested in the science class and frequently disobeyed classroom rules. In many ways this group that showed signs of becoming alienated from science class. Karen and Steve represented the group of students that shared an understanding that was somewhere between the two other social groups. If the climate of the class was academic, they appeared willing to participate, but if the climate was disruptive, they frequently supported the disruptive activity. While each member of Mr. Johnson's enriched and general science classes were different from the other, social groups of students appeared bound together by a collectively shared understanding of life inside Mr. Johnson's general or enriched science class.

The Development of Spatial Arrangements Between Social Groups and Further Evidence that the Enriched and General Science Classes Were Different

Mr. Johnson's classroom was arranged in six rows of movable desks lined up facing Mr. Johnson's desk, while the rear of the classroom was arranged in four rows of movable lab tables, each with four seats per table. One day, while analyzing Mr. Johnson's fourth-hour seating chart, I thought I saw a pattern developing. It appeared that some of the students that I had identified as showing signs of becoming alienated were now sitting in the back of the Mr. Johnson's classroom. This made me think back to the first day of school. That day in Mr. Johnson's science classes, I remembered seeing a few boys jockeying for seats at the end of the row (this was especially noticeable in Mr. Johnson's fourth-hour general

science class). I remembered why I had done this sort of thing when I was in school; I wanted to sit out of direct view of the teacher, that way I could get away with more mischief in class. Mr. Johnson altered the boys' plans by making his own seating chart (see Figures 1 and 2). At that time I didn't see a particular pattern between who the students were and where they sat. As the year progressed, a pattern began to emerge. The following vignettes will illustrate how the pattern started.

Monday mornings were usually the time that Mr. Johnson started new material. In the third-hour enriched science class he started a new chapter with those students. Soon the fourth-hour general science class would begin. As the students entered the classroom, I took my usual seat at one of the lab tables in the back. As soon the bell rang, Mr. Johnson began his daily attendance routine. After Mr. Johnson announced, "Open your textbooks to page 46. Yes, I said get out your books. Yes, that was page 46. That is where the chapter on vertebrate animals begins. Today we will read the chapter together out loud. Afterward, I want you to make an outline of the chapter by copying down the first sentence of every paragraph in the chapter. For those of you haven't realized, often the main idea of the paragraph is stated in the first sentence of each paragraph."

As Mr. Johnson directed the reading of the chapter, I overheard a conversation between two students. Dan, who sat in front of me, called out to Sam, "What a bunch of crap. Copy the first sentence of every paragraph," he said attempting to mimic Mr. Johnson voice.

Sam nodded his head in agreement.

"What did you think of the game Friday?" Sam whispered back.

"Awesome," replied Dan.

As the class continued it's reading activity, Dan, Sam, and now Steve continued with their conversation, only stopping when it was their turn to read or when Mr. Johnson looked in their direction.

I was always amazed at the way some students were able to carry on so much of their own personal conversations during class while still apparently participating in Mr. Johnson's academic activities.

"How many points did you end up with?" asked Sam.

"Fourteen," said Steve gloomily, "I missed a lot of easy shots." "We missed a lot of easy shots, too," snickered Dan, "but we were still able to beat you clowns."

When the rest of the class started working on their writing assignment, Sam, Steve, and Dan continued their conversation about the game, while giving the impression that they, too, were working on the writing assignment. This continued for at least 10 minutes. Finally, Mr. Johnson said, "All right back there; keep it quiet." Steve turned around. "Have some courtesy for those students still working."

Although the boys did halt their conversation momentarily, they soon returned to it. It didn't seem to make much difference what Mr. Johnson said or did; they seemed determined to continue their conversation, taking advantage of whenever Mr. Johnson was occupied with other things or when he was out of seeing or hearing range (Fieldnotes, 10/12/89).

This activity was not unusual in Mr. Johnson's fourth-hour general science class. Students would talk among themselves about items of mutual interest while giving the impression of looking busy. In the case of Sam, Steve, and Dan (and a few other boys), many times the topic of conversation was sports. For other students the subjects could vary. Activities before and after school, television shows, and other people were all popular topics. And many times, it appeared that as long as the students weren't loud or disruptive with their conversations and they at least appeared to be doing their work, Mr. Johnson would not break up these conversations.

To the person who has not been in a school for some period of time and might attribute this off-task behavior in the general class to disrespectful students, I suspect that this was not the case. Even in Mr. Johnson's third-hour enriched science class, this kind of activity went on between students. It appeared to be standard behavior.

For instance, one day while Mr. Johnson was giving his enriched science class a lesson, I noticed a girl standing away from her desk. The girl was Theresa and she was talking to another girl, Nicole, who sat two desks from her own. Apparently, Mr. Johnson didn't realize what was going on because he continued with his lesson, never saying anything to the girls. After observing this, I noted how long their conversation carried on. I estimated that they had talked for two or three minutes when Theresa finally went back to her desk. Yet after a few moments, she returned and continued

her conversation with Nicole, only this time she was kneeling. After another two or three minutes, Mr. Johnson said, "Theresa, would you please take your seat?" (Fieldnotes, 11/2/89).

I had witnessed that enriched and general science students carried on their own personal conversations during Mr. Johnson's class many times. However, today, because it was the beginning of a new chapter, I decided to look in Mr. Johnson's grade book to see how the students had fared on the previous chapter. To my surprise there appeared to be some interesting differences. For the most part, the enriched science students completed all of their assignments and received fairly good grades, while many of the general science students had missing assignments and/or poor grades on the assignments they had done (see Appendices Q and R). I wondered what could explain this. I concluded that the enriched students carried on their personal conversations while simultaneously fulfilling Mr. Johnson's academic requirements, while some of the general science students did not appear able to do that. A conversation that I had with Erin and Concetta later that week shed some light into this assertion.

"Yes, there is a technique involved in talking in Mr. Johnson's class. Most of the students know it; they don't want to get in trouble," Erin said.

Concetta agreed, nodding her head.

Erin continued, "You have to know when to talk and when to work. If Mr. Johnson gives you a lot of work, you don't want to

talk much; but if he is in a good mood and he doesn't give you a lot of work, then you can talk more." (Fieldnotes, 11/19/89).

The evidence above suggests that enriched science students seemed to know when to talk and when not to talk. They appeared committed to fulfilling Mr. Johnson's academic requirements, and they didn't appear to want their talking to get them into trouble with Mr. Johnson. I wondered if the general science students felt the same way.

Monday morning, and again Sam, Steve, and Dan were accomplishing their personal agenda while Mr. Johnson gave instructions to the class. On this day, Mr. Johnson, possibly irritated by their behavior, called out, "Steve, do you know what the assignment is?"

"No," replied Steve.

"Maybe you would if you weren't spending so much time talking," Mr. Johnson said.

Sam, Steve, and Dan all smiled sheepishly.

This appeared to cause Mr. Johnson to continue, "You guys think this class is a joke don't you, but you would be upset if I flunked you, wouldn't you? Sam, take a seat at that table in the back of the room, and, Dan, you take a seat at the other table in the back. Those will be your permanent seats from now on."

As the boys walked back to their newly assigned seats, Mr. Johnson came over to me and said, "I don't know what to do with those guys. It's really a pity, too. I see it every year kids that

pull this kind of stuff. How do you get kids like that to turn some of that energy into something useful?" (Fieldnotes, 11/10/89).

After observing other students being placed permanently in the rear of the room, I asked Mr. Johnson why he moved students back there. Paraphrasing Mr. Johnson's response, he moved students whom he felt excessively participated in personal conversations and activities while doing little or poor quality academic work to the back of the room because he thought they could get more work done if they were not seated next to other students (Fieldnotes, 11/29/89).

I understood Mr. Johnson's plan and the pattern that was developing in his seating chart. While this plan may have achieved one of Mr. Johnson's initial goals, which was preventing these personal conversations, it may have also had some unintended consequences. Another vignette will show what I mean.

Another day while the general science students were busy completing their assignment, I overheard Dan mumbling how boring this class was now that he was not located near his friends. After a moment or two, Mr. Johnson called out, "Dan get rid of the gum."

"I don't have any gum," Dan shouted back.

"Don't tell me you don't have gum; I saw you chewing it," Mr. Johnson replied calmly.

"I don't have any gum," Dan shouted again. Dan opened his mouth and wiggled his tongue around to give Mr. Johnson a good look. "See? No gum," Dan shouted triumphantly.

Mr. Johnson was caught; he could do nothing. He said, "OK, stop moving your mouth like you're chewing on something."

After that incident, Sam and Steve (and a few other students apparently loyal to Dan's cause) started moving their mouths like they, too, were chewing gum. Needless to say, not much more work was accomplished by these students the rest of the hour. Mr. Johnson, possibly irritated by some of these students' behavior, made the whole class sit up straight in their chairs and be totally quiet before he dismissed them (Fieldnotes, 11/13/89).

The next day I asked Karen (who was one of the general science students who had supported Dan in his pretend gum chewing escapade) why she had done so.

"Who, me? I did it because he deserved it. He's always having us do stupid things that don't make sense, like writing the first sentence of every paragraph in the chapter" (Fieldnotes, 11/14/89).

What these vignettes and informal interviews suggest is that the enriched science students and some of the general science students were different in regard to their commitment to fulfilling Mr. Johnson's academic requirements. Enriched science students frequently carried on their own personal conversations during Mr. Johnson's science class but appeared committed to fulfilling Mr. Johnson's academic requirements, while some students in the general science class frequently carried on their own personal conversations during Mr. Johnson's science class but did not appear committed to fulfilling Mr. Johnson's academic requirements. Some of these general science students' justification for not doing their work appeared to be related to the tasks they were asked to do by Mr. Johnson, particularly the copying of the first sentence of every

paragraph in the chapter. These general science students appeared to be calling into question the value of the work they were being assigned.

Mr. Johnson's plan of moving certain students to the back of the room appeared to have some unintended consequences, such as the development of conflicts between Mr. Johnson and the students now sitting in the back of the room. Furthermore, there appeared to be an allegiance developing among the students who were sitting in the back of the room and some of the other members of the class, in relation to their participation in mischievous behavior against Mr. Johnson's authority and requirements. To make this clearer, I have included a copy of the seating chart as it stood at this point approximately halfway through the year, highlighting the students who participated in the gum chewing escapade (see Figures 5 and 6).

I asked myself, "What's happening here?" My hunch was that Mr. Johnson's perceptions of the academic capabilities of the general science students led him to come up with a strategy for helping them make an outline. That strategy was having them copy down the first sentence of every paragraph in the chapter so the main ideas of the chapter would be in their notes. (It is important to note that Mr. Johnson told me that he had given these general science students the opportunity to outline, however, he found out that they could do it adequately). While it may be true that often the main idea of the paragraph is stated in the first sentence of each paragraph, this task doesn't give the students the opportunity to develop the skill of making an outline. In addition, because of its boring nature,

this task was seen as stupid to many of the general science students. Consequently, many of them either didn't do it or used it as justification for rebelling.

It was also interesting that Mr. Johnson didn't see the need to have his enriched science class use this strategy. Maybe it was because of the assumption he has about their academic capabilities. Instead, he asked the enriched students to make outlines of chapters by finding the main ideas embedded in the chapter. This meant that they were given the opportunity to develop this important skill.

But this is not just a question of having an opportunity to learn an important skill. The use of this strategy in the general science class and the absence of its use in the enriched science class represents a difference in the level of engagement in the subject matter that these two classes participated in at times. The task of copying doesn't require any thinking about the content, whereas searching through the chapter and finding the main ideas does involve thinking about the content.

Now, don't misunderstand what I am saying here. I had no expectation that all seventh grade science students will finish their science classes having learned all the same things. But I did assume that certain skills will at least be attempted by everyone and that the level of engagement would be such that students would be asked to think about the subject matter. What this evidence shows is that in this general science class, this wasn't being done. The enriched science students were given the opportunity to develop an important skill and to think about the subject matter. This

knowledge will most surely be useful to them later in life, especially if they go on to college. The general science students were not being given these opportunities, possibly because of the perceptions that their teacher had in their ability to do or learn it. What they did, instead, was copy out of the book. Clearly, this will not be of much value to the students later on in their lives.

The evidence above suggested that perceptions the teacher held concerning what the general science students were able to do or learn sometimes resulted in that class missing out on certain opportunities to develop skills and think about the subject matter. What I will illustrate in a subsequent section is that sometimes the teacher's perceptions extended not only to what he believed certain groups of students were capable of doing or learning, but also to what he believed these students would like to do in the first place. In the section called The Leaf Collection Project, I will illustrate this through the examination of a project called the leaf collection. The following section illustrates the academic work of the two science classes.

Academic Work of Mr. Johnson's Enriched and General Science Classes

As I mentioned before, Mr. Johnson taught both the third-hour enriched and the fourth-hour general science classes. In both these classes, Mr. Johnson divided his instructional school year so that he covered eleven chapters (Chapters 1 through 8 and 10 through 12) from the textbook entitled Life Science (1984). This textbook

explores the basic structures, functions, and interactions of living things. Mr. Johnson followed a fairly consistent pattern when teaching each chapter (see Figure 7). To illustrate the nature of that pattern of instruction more fully, I have included a description of the day to day activities of instruction for one representative chapter. This will serve as a model of the academic work done in all the chapters.

The representative chapter that I chose was chapter four. I chose this chapter because it contains most of the academic activities usually assigned by Mr. Johnson in a typical chapter.

Chapter four is entitled "Protists." It is a basic introduction to the structures, functions, classification, and interactions of protists. It is divided into the following sections: Bacteria, Protozoans, Slime Molds, and Viruses. Each section is a separate study unit that concludes with a section check-up. The chapter ends with a chapter summary, vocabulary words, and a variety of content and concept questions.

On the first day of instruction on chapter four in Mr. Johnson's enriched and general science classes, Mr. Johnson took about ten minutes of class time introducing the chapter and its objectives. Mr. Johnson started his introduction of the chapter by asking the students what they knew about organisms called Protists. He then lectured to them about some of the characteristics of protists. In the lecture he stressed why they are not plants and why they are not animals, and how scientists classify them. He then

read the chapter objectives to the class and included some additional objectives.

After the introduction of the chapter and its objectives, Mr. Johnson gave the students a reading assignment. The reading assignment involved having the students take turns reading one paragraph of the chapter at a time out loud. Mr. Johnson said he liked this activity because, "Then I know the kids have been exposed to the material at least one time. If I see it's going to get down to some student that can't read very well, several Vietnamese students just can't read much English and I have some kids with very low reading levels, then I would try to steer around so they get a small paragraph or maybe I'll even break a large paragraph into two pieces and give this kid one and give this kid the other half."

As the students took turns reading, Mr. Johnson periodically asked questions about various aspects of the reading. Occasionally, Mr. Johnson would elaborate on one of these questions and try to direct a short discussion about it. On this day, the students were not able to finish reading the chapter, so Mr. Johnson assigned the remainder as homework.

On the second day of instruction on chapter four, Mr. Johnson had his enriched science students make an outline of the chapter. To make this outline Mr. Johnson had the students write down all the topic headings throughout the chapter. Then he instructed the students to read the paragraphs under those headings. For each paragraph the student read, they were instructed to ask themselves,

"What was the main idea of that paragraph?" Then they were instructed to write down the main idea under that heading.

In the general science class Mr. Johnson instructed the students to write down the first sentence of every paragraph. This idea of having the students write the first sentence of every paragraph was something that Mr. Johnson did on a regular basis with this class. He believed that the text was written in such a way that, usually, the first sentence in the paragraph contained the main points of the paragraph.

Day three of instruction on chapter four in Mr. Johnson's enriched and general science classes was identical to day two. The students continued working on their outlines, and at the end of the class period they turned their outlines in to Mr. Johnson for grading.

On the fourth day of instruction on chapter four in Mr. Johnson's enriched science class, Mr. Johnson divided the students in six groups. Each group was assigned a topic and four questions related to that topic. Mr. Johnson told the students to answer the questions by working together cooperatively. The first group was assigned bacteria, the second group was assigned amoeba, the third ciliates, the fourth flagelates, the fifth sporozoan, and the sixth group slime molds and virus.

On the fourth day of instruction on chapter four in Mr. Johnson's general science class, Mr. Johnson gave them a worksheet on the chapter. The worksheet followed a fill-in-the-blank format. Students were instructed to read through the chapter and fill in the

missing words. The worksheet required the students to recall factual information from their reading of the chapter four. Afterwards, they were instructed to exchange worksheets with each other so that it could be graded. Mr. Johnson led the grading activity by asking students what was written on the worksheets they were correcting. These worksheets were then hand into Mr. Johnson so he could record the grades in his grade book.

On day five of instruction on chapter four in Mr. Johnson's enriched and general science classes, Mr. Johnson instructed the students to draw and label several pictures from the chapter, such as a typical bacteria cell, plant cell, and animal cell. When drawing and labeling these pictures, students were instructed to note that bacteria cells have structures which are similar to those of both animal and plant cells, but bacteria cells lack structures that either plants or animals cells have. These drawing were collected for grading.

On day six of instruction on chapter four in Mr. Johnson's enriched and general science classes, Mr. Johnson had the students start a lab entitled Microscopes (part A). Mr. Johnson spent the first ten minutes of instruction that day lecturing about the parts of a simple microscope and how to use and care for it properly. (I thought it noteworthy that in the enriched science class, all students were allowed to picked their lab partners, while in the general science class, some of the students were allowed to pick their lab partners while others, mainly the students who had been permanently assigned to seats in the rear of the room, had their lab

partners picked for them by Mr. Johnson. Mr. Johnson told me that he assigned these students lab partners in an attempt to separate potential problem students and/or enemies). Part A of the lab was called Looking at Fingerprints. The students were instructed by Mr. Johnson to read and follow the directions in the lab book for part A. As the students read and followed the directions, Mr. Johnson assigned questions from their lab book pertaining to part A. Students worked together on the lab and on the questions with their lab partner.

Day seven of instruction in Mr. Johnson's enriched and general science classes was a continuation of the lab entitled Microscopes, only this time they worked on part B and part C. Part B was called Types of Microscopes and dealt with a simple introduction to different types of microscopes. Part C was called Parts of the Microscope and dealt with the identification of the parts of a simple microscope. The students were instructed by Mr. Johnson to read and follow the directions in the lab book for part B and C and to answer questions that he assigned from their lab book pertaining to part B and C. Students worked together on the lab and on the questions with their lab partner.

Day eight of instruction in Mr. Johnson's enriched and general science classes involved having the students finish the lab entitled Microscopes (part D). Part D was called Find the Missing Letter. The students were to cut out the letter "k" from a newspaper and then prepare it so it could be viewed with their microscopes. The students were instructed by Mr. Johnson to read and followed the

directions in the lab book for part D, while Mr. Johnson assigned questions from their lab book pertaining to part D. After the students completed part D, they were instructed to hand in all the answers to all the questions for parts A, B, C, and D of the lab.

Any students who finished early were given a puzzle that helped them build their vocabulary and a worksheet that covered concepts presented in chapter four of their textbook. The worksheet was on the multiple choice, filling in the blank, and essay question format. The worksheet required the students to recall factual information from their reading of the chapter four and to explain certain concepts presented in chapter four.

Day nine of instruction in Mr. Johnson's enriched and general science classes involved having each student either find vocabulary words related to chapter four in a word search, or finish any part of the lab entitled Microscopes, and/or finish the worksheet from the previous day. At the end of this class period, the lab questions and the word search were collected by Mr. Johnson. Most of the time, one class would grade another classes work under Mr. Johnson supervision. Occasionally, Mr. Johnson would select one of the enriched science students and have them grade the papers of the general science class or he would grade them himself. Mr. Johnson usually did the recording of all the grades in his grade book. Students received credit for doing the word searches only if it was completed or nearly completed.

The next day was the last day of the first marking period. Mr. Johnson had to do some procedural things for the school. He had to

collect, examine, and return the textbooks for every student. These activities took the entire class period, so no instruction on chapter four was done in either of Mr. Johnson's classes that day. The students were given free time to work on any subject they liked.

Day ten of instruction on chapter four in Mr. Johnson's enriched and general science classes involved having each student do the chapter four check-up questions located at the end of each section in the chapter. Each section check-up asked the students to answer two or three questions related to the section to reinforce their learning. The questions usually involved explanations of key concepts and principles presented in the section. These questions and answers were collected and graded by student aids or by Mr. Johnson himself. Occasionally, Mr. Johnson would select one of the enriched science students and have them grade the papers of the general science class.

Day eleven of instruction on chapter four in Mr. Johnson's enriched and general science classes involved having each student do a crossword puzzle that Mr. Johnson gave them. The crossword puzzle used terms and phrases presented in chapter four as puzzle clues. (I found it noteworthy that after the students were finished with the crossword puzzle, Mr. Johnson allowed the enriched science students to study in small groups for the test they would be having soon covering material presented in chapter four. The general science students were instructed to study alone. Mr. Johnson told me that he had the general science students study alone because if he allowed them to study together, they tended to talk about each

other or sports, they would not study). At the end of these class periods, the crossword puzzles were collected by Mr. Johnson. Students received credit for doing the crossword puzzle only if it was completed or nearly completed.

On day twelve of instruction on chapter four in Mr. Johnson's enriched and general science classes, the students did the chapter check-up questions, located at the end of chapter four, as a practice test. The chapter questions consisted of ten vocabulary matching questions, five content fill-in the blank questions, five content multiple choice questions, ten content short answer questions, and five concept essay questions. The answers to the practice test were presented at the end of the class periods by Mr. Johnson. The practice test was graded by the students themselves, but not collected or recorded in Mr. Johnson's grade book.

On the last day of instruction on chapter four (day thirteen), Mr. Johnson gave his enriched and general science students a test on the material covered in chapter four. The test was the standard test suggested by the publisher of the text. It consisted of ten multiple choice questions, ten matching questions, and five essay questions. Mr. Johnson picked out two of the essay questions and had the students answer those two only. Mr. Johnson allowed the students to use their notes but not their books while taking the test. At the end of the class periods, the tests were collected and graded by student aids or by Mr. Johnson himself.

As can be seen, Mr. Johnson taught both classes basically the same material at more or less the same rate, although, occasionally,

the enriched class did some activities that the general class did not do and, occasionally, Mr. Johnson let the enriched science students work in small groups. The general science class rarely worked in small groups except when doing a lab (my fieldnotes recorded only five times throughout the entire school year).

The Leaf Collection Project

The leaf collection assignment was a project that Mr. Johnson reserved for his enriched science class only because, to paraphrase Mr. Johnson, enriched science students are supposed to be able to comprehend and do things that general science students are not able to do or are not interested in doing. This project was seen by Mr. Johnson as a highly motivating and worthwhile assignment, allowing students to create something that they could keep and be proud of, as well as teaching them to observe, classify, categorize, analyze, and interpret data. The inclusion of the leaf collection project in Mr. Johnson's enriched science class and the absence of it in Mr. Johnson's general science class shows a interesting contrast in the experiences that these students were given in their respective science classes.

The following vignette began at 10:02 a.m., three minutes before Mr. Johnson's third-hour enriched science class was to begin. As some students stood around in groups of two or three talking to each other either inside the classroom or in the hall just outside the classroom, other students took their assigned seats or wandered around the classroom scanning Mr. Johnson's displays and

chalkboards. At 10:05 a.m. the bell sounded, signaling the start of third-hour classes. Instantly, those students left in the halls and those in the classroom hurried to their assigned seats. It was time for Mr. Johnson's third-hour enriched science class to begin officially.

The class started with the students waiting while Mr. Johnson did his attendance routine. Mr. Johnson then stepped to the front of the classroom and said, "OK, listen up." He waited for a moment while the class settled down; then, he proceeded to speak. "Today we will be starting a project that I'm sure you'll all enjoy. You will be making a leaf collection. I'll explain the guidelines." Mr. Johnson then passed out a leaf collection guideline sheet and a table of content sheet to all the students. He began reading from the guideline sheet. "Number one, you must have the correct leaf to be eligible for any points on a page. Number two, all information on the mounting sheet must be printed. Number three, you may earn one point for the correct leaf properly mounted, one point for the scientific name properly spelled, one point for the date collected, one point for the place collected, and one point for the collector's name. This is a total of five points per page if the information is correct and all directions have been followed."

Mr. Johnson then looked around and asked if there were any questions. Marty shouted from the back of the room, "Is this for extra credit?"

"No, this leaf collection counts for half of your second marking period grade," Mr. Johnson replied. Then he continued

reading the rest of the guidelines for the project. "Number four, you must arrange your leaves in order according to the content's page." Mr. Johnson held a content's page up so the students could see it and identify their own. He continued, "Number five, leaf collections may be turned in from October 18 to October 20, 1989, without penalty. After October 20, 1989 you will be marked down one grade each day it is late. Number six, do not use numbers for the month, use the abbreviation for the month and be sure you include the year. For example: October 7, 1989. Number seven, leaves must be mounted with their upper surface up. The exception to this is when you mount a Red Oak or Black Oak. In order to identify these two leaves, they must be mounted with their lower surface up. Number eight, for place collected, put down a large town, a city, or the county; be sure you include the state. For example: Loran, State, or Jackson County, State. Number nine, do not collect leaves at State University, Loran Arboretum, or Woodland Park. Number ten, we may keep up to five leaves from each collection to put in school leaf collections. Number eleven, grading scale: 90 points for an A, 80 to 89 points for a B, 70 to 79 points for a C, 60 to 69 points for a D. Number twelve, to get an A on this leaf collection, you must turn it in on time and have enough points. Number thirteen, this leaf collection counts 50% of the second marking period grade. Number fourteen, don't climb trees to get leaves."

Mr. Johnson again looked around and asked if there were any questions. There were none, so Mr. Johnson introduced the next activity on his agenda. "Get your books out and open to page 70.

We will be starting a new chapter today, 'An Introduction to Plants.'"

The next 15 minutes were spent having different students read aloud. The other students listened and followed along, reading silently to themselves. All the readers appeared to have good reading skills. Afterward, Mr. Johnson passed out worksheets on which the students were expected to answer some questions related to the reading. Mr. Johnson turned to the class and said, "OK, you guys know what you're supposed to be doing; let's get going." Before the students began working on their worksheets, there was the usual hunt by some students for something to write with.

At 10:50 a.m., Mr. Johnson announced that there were 10 minutes left in the class and that they could spend the final minutes working on this assignment in small groups if they could be totally quiet for two minutes first. Mr. Johnson timed the students and they took advantage of this opportunity to work and socialize, mostly socialize together by making the time limit. The students worked together in small groups until the bell sounded, signaling the end of third hour.

At 11:02 a.m., Mr. Johnson's fourth-hour general science students began entering the classroom. They, too, visited with each other just as the enriched class had done. I could hear Dan telling jokes to two other seventh-grade general science students, Karen and Steve. They were still laughing and carrying on well after the bell rang. Mr. Johnson again started his daily routine of attendance-taking. Afterwards, I expected him to do with the

general class the same things he had done with the enriched class. To my surprise, he didn't. Instead, Mr. Johnson skipped the leaf collection project and directed the students to open their books to the new chapter they, too, were starting today. It was the same chapter ("An Introduction to Plants") that the enriched science students had started today in third hour. Mr. Johnson gave his general science students an overview of the chapter and then instructed different students to read aloud. Mr. Johnson said, "OK, Mary, why don't you start the reading?"

As Mary read out aloud, the other students were expected to listen and follow along reading silently to themselves. One by one, following the order of the seating chart, Mr. Johnson had the students take turns reading a paragraph at a time. Some students appeared to have good reading skills and some didn't. For example, when Tyrone's turn came, a student that I found out later was a special education student, Dan said, in a low voice that Mr. Johnson couldn't hear, "He can't read. I bet he doesn't even know how to tie his shoes in the morning." Sam then let out a "Duh" from the back of the room, and a few students started snickering.

Mr. Johnson stared at the class for a moment and then turned to Tyrone and asked him to give it a try. Tyrone tried to ignore the comments and began to read. When Tyrone made mistakes, Mr. Johnson helped him. Sam was pointing to his head and making circles. I had seen this gesture before; it meant that Tyrone was dumb.

About 15 minutes of class time was spent on this reading activity. Afterwards, Mr. Johnson passed out the same worksheets

that he had handed out in the enriched science class. He said "Put your name and hour on the top of your worksheets; remember no name, no credit. Any questions? OK, get going."

As the students began to work on their worksheets, Dan shouted out to Mr. Johnson, "I don't have a pencil."

Mr. Johnson said with a puzzled look on his face, "Why did you come to school without a pencil? I don't understand."

Dan shrugged his shoulders.

Mr. Johnson said as he scanned the room, "Does anybody have an extra pencil that Dan can use?"

A few students started searching through their belongings for an extra pencil, but no one came up with one. Mr. Johnson shrugged his shoulders and said, "I don't know what you're going to do?"

Most of the students in the class watched to see what Dan would do. Dan slouched back in his chair and did nothing. After a while, I looked in my briefcase and found a pencil that I gave to Dan. He looked up at me and the corners of his mouth curved upward and formed a smile. He took the pencil and began to work on his worksheets.

After about 20 minutes Mr. Johnson asked the class, "How many of you are finished?" About half of the students raised their hands. Dan, sitting at a table in the back, winked at Sam who sat across from him at another table. Dan then announced, "I'm not finished." Sam, realizing what Dan was up to announced, "I'm not finished either." Then they both smiled. Needless to say, they

both were probably finished, but they didn't want Mr. Johnson to know that.

"Well, let's hurry up; class will be over in 10 minutes." Mr. Johnson then announced that they could spend the final minutes working on this assignment in small groups if they could be totally quiet for two minutes first. Mr. Johnson timed the general science students, just as he had done with the enriched science students, however the general science students did not take advantage of this opportunity. They never made the time limit and consequently they were not allowed to worked together in small groups (Fieldnotes, 10/29/89).

When I analyzed this vignette, I again saw differences between the two science classes. There was a difference in the activities that these classes were exposed to, there was a difference in the variability between students' reading skills, there was a difference in the involvement of the students in the subject matter, and there was a difference in the social interaction between the participants (good will among fellow students and between the teacher and the students), as well as the social interactions (working in small groups) permitted by their teacher in the classroom.

I decided to ask Mr. Johnson about his decision to expose the enriched science class to the leaf collection project and not the general science class. The following is an excerpt of an interview that I had with Mr. Johnson about this topic.

R: ....Now the things I want to ask you are what are the advantages and disadvantages for the enriched kids doing the leaf collection project and the advantages and disadvantages of the general science kids not doing it?

T: The general science kids?

R: Looking at the advantages and disadvantages.

T: General science students can't or won't do the assignment. It just requires more than they seem to be able to put forth, and I think its in addition to them not being able to do it. I think a lot of them just don't want to. The enriched kids get to learn how to classify, how to observe, more in-depth on actual things.

R: What do you think the disadvantages are for the general science class. What do you think about the disadvantages?

T: Of the kids not doing the leaf collection?

R: Yeah.

T: The disadvantages?

R: And how it relates to some of the criticisms people might say about these kids not being able to have the opportunity to do certain activities.

T: Some of the kids who may want to do that sort of thing don't get a chance to. I almost always make extra credit available and one of the ways extra credits available is --let the kids who want to do a leaf collection, and very few of them do it. In fact the year that you were here, nobody did it for extra credit. So I don't really see too much wrong with that.

R: But what do you think the disadvantages are, as far as science is concerned?

T: They don't get to, there aren't that many cause they don't want to do it and if they do wish to do it they have the opportunity and in last year's case they chose not to, so I really don't see anything wrong in that. They do other things. Twenty seconds, okay?

R: Okay, thank you for the interview and.

T: Sorry it's so short.

R: No, it's fine. Stop. (Teacher interview, Apr. 10, 1990).

The differences between these two science classes appeared to be related to perceptions held by the participants. These perceptions appeared to influence the participation of the participants of the classrooms. For example, Mr. Johnson's perceptions of the two science classes and his experience with enriched and general science students influenced his decision to provide the two science classes with different access to certain activities. He perceived that the general science students would not be able to do the leaf collection project and that they wouldn't want to do it in the first place.

Appendix G displays other activities experienced by the enriched class, but not by the general class. While I did analyze these activities from a particular point of view, that being that some activities are more valuable than others, these activities could have important implications for the futures of the students involved. For example, if students in the enriched science class were given more opportunities to do activities that allowed them to obtain additional practice at observing, classifying, categorizing, analyzing, interpreting, and thinking about the subject matter, and the students in the general science class were not given this additional practice, it would not surprise me if enriched science students were better prepared for high school than general science students.

Keeping the Two Classes in Synchronization

Mr. Johnson chose to keep his enriched and general science classes at approximately the same place (in terms of advancing to different chapters) so as to avoid confusion on his part in ordering films, preparing handouts, grading papers, and preparing lesson plans, although they contained students who were supposedly different academically. If, for some reason, such as the enriched students' doing a project that the general students weren't doing, the two science classes got out of synchronization, Mr. Johnson would either speed one class up or slow one down. While some might question the legitimacy of such time management, Mr. Johnson's reasoning made it seemingly unavoidable. He pointed out that preparing labs meant setting up experiments, and having to set up two labs the same day with equipment restrictions and space limitations would be difficult (Fieldnotes, 4/19/90).

An example of keeping the classes in synchronization occurred during the leaf collection project which the enriched science students were doing and the general students were not. Yet over that period of time, I observed that the two classes covered the same chapter. In this case, the general science students covered it at a slower pace than the enriched science students.

In order to get an idea of how much slower the general science class had to proceed through the chapter, I asked Mr. Johnson to express the extra time that the leaf collection required of the students in the enriched science class. The following is an excerpt of an interview I had with Mr. Johnson.

R: ....Could you summarize the amount of time students worked on their leaf collection and what they did in class and how you assisted them. For instance, in a week's time.

T: In a typical week, if the kids put in a normal amount of work, they had at least one day during the week to identify them. One hour a week in science class. Plus they have to go out and actually collect the leaves and dry them properly.

R: But they don't go out and collect the leaves while in science class?

T: Okay, they have one hour a week minimum. Sometimes they had two days or two hours a week.

R: I remember sometimes kids would finish their assignments early and they would be allowed to go back [to the back of the room] for the last ten minutes and work on their leaf collection.

T: Yes, okay. Sometimes I do that. If the kids were all done with what they were supposed to do, I would let some go back and work on that.

R: You would have your little book [The Golden Nature Guide] on Leaves.

T: There were some leaf books [A Golden Guide-Trees] that the kids could check out that are owned by me personally. They were willed to me from a teacher that used to be here. The kids check those out and they can use them all hour. They have a number on them so I know who has what and so forth. They could do a decent job using just that. What happens a lot of the times is when they get into this, two or three weeks, they really start liking this so they will go out and buy their own. I see that year after year. Which is a nice plus.

R: To assist them, they would have a leaf and they would ask you what?

T: The kids would come up to me with a leaf. Unless they were mired down to the hubcaps, I would never tell them the leaf. You can come up and ask me, if this is a cottonwood, and I would say yes or no. But I am not going to, if you come up to me and say, what is this, I am not going to tell them. That forces them to look at the leaf

> carefully, to go through the couple of keys that kids use, to cooperatively learn, maybe somebody out there knows what it is, to trade back and forth, scientist sometimes do this, kids can too. I have several other references, but we don't want to give the kids too much information at this stage of their leaf collection life, that I use. The leaf collection students are capable of using that. They can always come in before and after school and there were some that did that. (Interview conducted, 4/19/90)

In Mr. Johnson's effort to keep the classes in synchronization, such as occurred during the leaf collection project, the general science students had to cover the chapter at a much slower pace and the enriched science had to cover the same chapter at a faster pace. As was seen in the leaf collection vignette, one of Mr. Johnson's strategies for accomplishing this appeared to be allowing the enriched science students to work in small groups (possibly allowing them to finish faster). While this might have accomplished his goal, it appeared to have some unintended consequences as will be seen.

Since general science students had to spend more time working on the same material, the possibility existed that some students would be off task. From my observations of this class, I would say that this occurred many times when Mr. Johnson used this strategy. As was seen in the leaf collection vignette, Mr. Johnson tries to keep the students from being off task by keeping them busy with book work. One problem with using this strategy was that the general science class appeared to have students in it who had problems behaving. This should not be surprising because, while schools that ability group may try to distinguish between students who are poor

achievers because they lack skills or aptitude and those who are low achievers because of disruptive behavior, this is nearly impossible. What happens, it seems, is that classes with students who find it hard to learn are mixed with those who find it hard to behave. This possibility might be the case that caused Mr. Johnson some real discipline problems with his general science class. He appeared to find himself having to be more of a disciplinarian with this class than he would have liked to be, i.e., not allowing the general science class to work in small groups as frequently as he would have wished.

In addition, the enriched students received more opportunities to interact with each other socially during class time because of the nature of the activity they were doing. For example, in Mr. Johnson's description of the extra work that the leaf collection project provided, one can see plenty of opportunities for such interaction.

Another thing that resulted in the enriched science students' receiving more opportunities to work together in small groups was their good behavior. Mr. Johnson used a strategy that rewarded the class that could work quietly alone for a certain amount of time, say 10 minutes, by allowing that class to work in small groups for the rest of the class time. For example, on certain days Mr. Johnson would say something like this to all his class, "If you guy can work quietly alone for ten minutes, I'll allow you to work together for the rest of the hour, but if I have to tell someone to stop talking before that 10 minutes is up, I will have to reset my

watch to 10 minutes and start over." An unintended consequence of this strategy was that the enriched science class seemed to have no problem making the time limit, although the general science students frequently had trouble making the limit. This meant that frequently, when Mr. Johnson used this strategy, the enriched science class would end up having far more time to work in small groups than the general science class. This all added up to general science students' not getting as many opportunities to interact with each other socially during class time. From my Fieldnotes, I recorded that the enriched class was allowed to work in small groups 31 times throughout the school year, 6 times more than the general class.

The Science Camp

The next matter of attention concerns a science camp which is offered to all science students at Loran. The science camp provides Loran teachers with the opportunity to teach science differently from the classroom method and students with the opportunity to study nature first-hand. It also provides teachers and students with the opportunity to see each other in a different light, thus helping build interpersonal relationships. Like the leaf collection project, it provides the students the opportunity to observe, classify, characterize, and analyze nature the way scientist really do. Yet, also like the leaf collection project, the science camp was not experienced by many of the students in Mr. Johnson's general science class. The following analysis of the science camp will

elaborate on the differences between the worlds of science for the general and enriched science students.

I was first made aware the existence of the science camp by Mr. Johnson. During the first week of the school, he told me about some of the activities that his classes would be doing during this school year. He said that one thing they do every year is take the kids to a science camp for a week. "The kids really enjoy it, and I can get about six weeks worth of science class in the week that we're down there. They go cross country skiing, canoeing, and we can take the kids for a walks so they can look at things through a hand lens; things like that. You know, I bet I could work it out so that this year you could go with us. It would be a really good thing to put in your research."

I could sense that Mr. Johnson was really proud of the things that he was able to do with his students at science camp, and I earnestly looked forward to the opportunity to witness it. As that time drew nearer, I became more and more intrigued about camp, and this led me to question Mr. Johnson about it on many occasions.

Concerning the history of the science camp, Mr. Johnson informed me that the Franklin Environmental and Conference Center where the camp was held opened in 1981. It is a place that science teachers in the Loran School District could use as a science camp for students presently taking science courses. The school district purchased the Center, and Mr. Johnson believes the money came from private donors. There is a plaque in the main office of one of the buildings that contains names of people who donated large amounts of

money. Mr. Johnson really didn't know why the Loran School District got involved in building this science camp, but he did know that he had gone there every year it has been open. The Center is located on a generous portion of property approximately 50 miles west of Loran. It is surrounded by two heavily wooded areas, a small lake, and three adjacent buildings, two of which are dormitories.

Mr. Johnson's goals at the camp were to teach the students things that he could not do in that way back in his classroom. Also, he got a chance to see the students in a different light, and they got to see him in a different light, providing a different kind of rapport between them.

Mr. Johnson went on to inform me that because science is a required course at Loran and only science students are allowed to go to the camp, parents generally find out about it from science teachers who, representing the school, send home flyers (near the beginning of the year), telling them about their children's opportunity to go to science camp and its cost. The year that I went along, it cost each student's parents $55.00. Mr. Johnson told me that in years past, it had cost considerably less, as low as $35.00. It seems that every year the cost has gone up. I also learned from Mr. Johnson that the Loran School District put up part of the cost of students going because other school districts have to pay approximately two-thirds more. Another way that students can pay for their science camp trip was by selling candy or other various things (although candy sells best). Mr. Johnson said that there was tons of paper work involved in that for the candy company,

the school district, and for the teacher because students have their own individual accounts. Typically, students earn about one dollar for every box of candy that they sell. So if a student sold 55 boxes of candy this year, he/she could go free (Interview, 4/19/90).

One question about which I was curious was who goes to camp and how that decision is made. One aspect of this came to light a few weeks prior to the students going to camp.

I arrived at Mr. Johnson's third-hour enriched science classroom and saw some things that I had observed on a regular basis on Mondays. A few teachers, including Mr. Johnson, were gathered in the back of the room talking and drinking coffee. Soon the bell rang and Mr. Johnson moved to the front of the classroom and began his usual routine of attendance taking. "Who's absent in this row?" Mr. Johnson said out loud as he walked past the rows of students. After that, Mr. Johnson gave the students an announcement about science camp. Summarizing Mr. Johnson's announcement, he reminded the students that the science camp was happening in a few weeks and everyone should really try to go because science camp is a great learning experience and is fun, too. Mr. Johnson also reminded them to be sure they turned in their signed permission slips and their money from selling candy. He then read off a list of the students who hadn't turned in their candy money. One extra topic that Mr. Johnson talked about with the students that he had not included in previous announcements about science camp was the list of things that students should bring and not bring with them to camp.

Questions and answers about science camp continued for several minutes.

The announcement about science camp to the general science class had special meaning. Mr. Johnson's announcement began in the same way it had in the enriched science class. He reminded the students that the science camp was happening in a few weeks and that everyone should really try to go because science camp is a great learning experience and is fun, too. Mr. Johnson reminded those students to be sure they turned in their signed permission slips. However, instead of talking about candy money or what to bring or not bring to camp, he reminded the students that the school district's policy was that any students who received a four or five in citizenship from any teacher during the second marking period was not eligible to go to camp. This brought about a chorus of rumblings.

"I don't care; I wasn't going anyway," I heard Dan say under his breath.

"Yeah, I don't care either," Sam blurted out, following which Mr. Johnson moved to a different topic.

This episode, and the fact that Mr. Johnson did not elaborate on any other science camp business, made me curious about the number of students who were going to science camp from this general science class versus the number going from enriched science class. To my surprise, I found out from Mr. Johnson that only one student in the general science class had signed up to go to science camp and that all but two of the students in the enriched science class had signed

up. I wondered if the school's policy of not allowing any students to go to camp who received a four or five in citizenship from any teacher during the second marking period was the reason for the disparity. In a subsequent interview, Mr. Johnson identified two reasons that he thought contributed to this disparity. The following is an excerpt from that interview.

R: These questions [about science camp] are more specific to your general and enriched classes. Were you surprised that only one student in the general science class went to camp?

T: Yes, that seems to be a little bit low. Usually it is more than that. Enriched kids go to camp more than general class kids. A lot of time it is money. Kids can't get the money together. Even though we have the candy sale to earn the money, some kids can't make enough to go. The typical deal is for the parent to say, you earn half the money, and we will pay half the money. That happens a lot . . . .

R: Who [which science students] is eligible [to go to science camp] and who is not?

T: At the start of the year any kid is eligible to go down there. We have a Loran School District rule that any youngster that has a four or a five in citizenship from any teacher, not just from me, can't go to camp. I pretty much agree with that. We don't need kids down there who are going to mess up and cause problems . . .

R: Why do you think so few went out of your general science class?

T: I really don't know. My guess would be money. I know that a lot of kids had fours and fives and even the ones that didn't and could have gone, didn't and I really don't why . . . .

R: Do you think there is a way to handle it so that more general science students, like your class, could go or do you see more problems if more of those students went?

> T: I think if some money was available it would get some of them down there. As far as the citizenship, if we end up having to take some kids that don't behave themselves, it would probably be the quickest way to kill the whole camping programs because those kids will cause you major problems very quickly (Interview, 4/10/90).

During the week of March 5 through March 9, 110 Loran science students, three science teachers (Mr. Johnson, Mr. McDonald, and Mrs. Jones), one former Loran science teacher (Mr. Thomas), one vice principal (Ms. Powell), a few parental chaperones, a few high school student chaperones, and I finally got our opportunity to experience the science camp for 1990.

In the next section, I will examine some of the happenings at science camp. Attention will be focused on the activities the students experienced while at camp, even though, at one time or another, I witnessed most of the activities myself. The general perspectives of the camp experience as seen by a few students will also be included. I hope to present a picture of the science camp as seen from the inside, by a cross-section of the students themselves. We now begin our trip to the Loran Science Camp.

As the big yellow buses rolled into the camp parking lot and the students filed off the buses, I wondered what the general students were doing back at Loran. The staff gave out dormitory assignments, and students hurried to claim their bunks, unpack, and attend orientation in the dining area. At orientation, I sat close to some of Mr. Johnson's students. They were busy listening to the camp staff introductions. The staff included a psychology coordinator, a health officer, a secretary, and two naturalists.

The school district also hired cooks proportional to the number of student attending and several custodial people. Other staff members included a person hired to teach Native American studies and high school students hired as "counselors in training." Mr. Johnson informed me that these high school students had been involved in the science camp in previous years and had proven to be trustworthy.

Most of the discussion at orientation consisted of an explanation of the rules and duties of the students while at camp. One special duty that really impressed me was explained to the students by a member of the staff.

> S: "One student a meal will be chosen to be a 'Hopper' for their table. The hoppers' responsibilities are to come to the cafeteria 15 minutes prior to meals, in order to set the table. In addition, the hopper will be responsible for serving their table, which means that if anyone at their table wants an additional food item, you tell the hopper and the hopper has to bring that item to the table. Let me warn you, please don't misuse your hopper because you might be a hopper at the next meal. The rational for this is to avoid swarms of kids coming up to the cooks, requesting additional food items. After the meal, the hopper will clear and wipe the table, sweep the area surrounding the table, and make sure the chairs are placed neatly under the table. A table of four or five students will take turns being the hopper." (Fieldnotes, 3/5/90).

As the staff member explained the responsibilities of a hopper, I could tell by the students' body language that many students disapproved of this duty, yet few ill words were murmured.

Also during orientation the students were told about an item that they would be making in arts and crafts, a leather badge with a rawhide string hanging from it. When students completed an activity, the instructor would give each student a different colored

bead. At the end of the week each student could have 12 to 15 beads strung from her/his badge. She/He could look back and say, "I got this bead for participating in such and such activity," and so on. One special bead that was not given out to every student was one students had to earn. Staff members gave this bead to students who did something special to help another student or staff member. At the end of orientation, the students were put into groups of about 10, and each group was assigned an camp activity. Each activity was supervised by members of the staff and usually lasted about 90 minutes, after which the groups rotated to a different activity. Two activities were scheduled before lunch and two more after lunch. This pattern was followed each day of camp.

Tiny Things was the first activity that I was able to attend with the students and observe. The staff member who led this group was the vice principal Ms. Powell. Mr. Johnson told me that the vice principals love coming to camp.

> J: "They [vice principals] love it because, let's face it, the assistant principals do not have much contact at all with the types of kids that go to camp. They deal with the low life, the scums, the drug dealers, the ones that bring weapons, the ones that make gestures to teachers. Those are the kinds of kids they deal with all day long. They go down to camp and here are kids that cooperate, are eager to learn. They just love it." (Fieldnotes, 3/5/90).

Before we left for our Tiny Things activity, Ms. Powell distributed hand lenses to each student in the group. Then, as the group walked along the trails, Ms. Powell encouraged them to examine tiny things with their hand lenses. This was done in a very informal manner, and everyone got involved in the search. Once

something was found, Ms. Powell would try to get everyone to examine and discuss it as a group. I asked Ms. Powell the main thing that she wanted the students to learn. She said she wanted the students to learn how to use a hand lens.

Another activity I had a chance to witness was the Forest Walk, led by Mr. Thomas. He had just retired from teaching science at Loran the previous year. Like Mr. Johnson, he had attended the science camp every year that it had been offered, so he knew his way around the forest. As Mr. Thomas took his group of students through the forest, he stopped along the way to note the different types of trees and other foliage present there. Most of the information that Mr. Thomas shared with the students dealt with why certain plants were present in certain areas of the forest and not in others. The primary things that Mr. Thomas told me he wanted the students to learn were how to tell the age of a tree by counting the rings of a cross-section of the trunk and how maple syrup was extracted from a maple tree. He stressed these concepts by showing the students how to use an instrument that tree scientists use to bore out a small section of the tree trunk and examine it for its age. Mr. Thomas also demonstrated how to tap a maple tree for syrup, and the students even got a chance to taste some of the sticky, sweet liquid that came out of one of the trees.

In Pond Study students learned about different kinds of plants and animals that live in ponds, after which, students could examine a drop of pond water under a microscope.

Native American Studies was another activity. It was taught by a man who wore a complete Indian outfit. Students learned about different kinds of clothing that Native Americans wore.

There was a Lake Walk where students and teachers walked around the lake, discussing the ecology and the animals that live there. There was a Prairie Walk where they did the same thing, only related to prairies. There was Owl Pellets, where students could dissect an owl pellet, and there were survival classes, snowshoeing, canoeing, archery, and cross country skiing.

Altogether there were more than 10 activities. Even at night, students could chose between activities such as a night hiking, searching for owls, fishing, arts and crafts, environmental education bingo, and environmentally-oriented computer games. Or they could study or watch science-related TV, like programs from Nova or a similar series.

After observing a few of these activities, I decided to try to get the perspective of the camp experience as seen by a few of Mr. Johnson's students. The following interview with Erin from third-hour enriched science class is an example of the typical perspectives shared by most of his students.

R: What are you doing today [at camp]?

E: Well sir, I just got up and got ready and ate breakfast and the first activity for me was listening to Mr. Neebler talk about Native Americans, and then we went...

R: What did you learn about them?

E: We learned about culture and how his family lives, he keeps the old traditions and still speaks his natural language and everything. After that we went cross-country skiing and we just went across the field and skied around and ate lunch, then...

R: What did you have for lunch?

E: We had tacos for lunch with cinnamon cookies and pineapple and then went back to our dorms, slept or read for an hour and then went into a third activity which for me was Owl Pellets and we dissected these pellets and found bones and I found a rat scull.

R: So far what do you think about the camp? Is it fun and what are you going to tell the kids who didn't go?

E: Yea, camp is real fun, I'll tell them they missed out because for one thing you don't have to do all the paper work you have to do at regular school, and you get to visit with your friends everyday at lunch.

R: And how is your relationships with your teachers now that they are not so much teachers now, they are kind of like...

E: It's real different seeing your teachers, like at school most of them are always dressed in suits and they're always real perfect and then you come here and you see them in jeans and hats and running around and acting like kids.

R: OK. Thanks a lot, I'll talk to you more later (Interview, 3/7/90).

All eight of the students interviewed seemed to enjoy getting out and having first-hand experiences with nature. This overall feeling could be seen in their responses. For example, in the interviews I asked several students, "What are you going to tell your friends back at school who didn't come [about camp]?" Some of the responses these students gave were the following.

> Well it would really depend on the reason why they didn't go. If it really wasn't an important reason, I think they should have went to camp because it is a better way to [learn]. Maybe you learn the same thing at school, but like you couldn't go out to the lake and have a hands on experience with it. Have a personal experience.
>
> Well, I really enjoy going out and studying the outdoors and having the activities because they seem really interesting. It was a good experience and they should think about going next time.
>
> Well, the activities are fun, so yeah, [they should have come to camp] (Interviews, 3/7/90).

In addition, many of the students interviewed seemed to enjoy seeing their teachers in a different light. Another example of this overall feeling can be seen from this excerpt from an interview with Marty.

> R: How about your relationships with the teachers here? Do you have a different relationship here than when you're in school? Does it seem different or is it still the same?
>
> M: It's different, because in school they are like the superior person and here they are like, they don't know what they're doing as much as you do so they can learn as well as you. So they are pretty as much the same as you in camp (Interview, 3/7/90).

All in all, the science camp experience appeared to be a success, although there were some things that the students shared with me that were not positive. For example, many students expressed displeasure with the bunks, the mandatory rest period, and certain activities. Some of their comments were the following.

> . . . What I don't like is the bunks. They are all hard and solid.
>
> [What I don't like is] When you have to sit on your bunk and do nothing [referring to the mandatory rest period].

> The things I liked were the Survival [Activity] and the Tree Hike. The ones I disliked were the Pond Study, the Owl [Pellets] Study, and this other thing I don't remember [the name]. (Interviews conducted on 3/7/90).

The final issue that I want to shed some light on is what the general science students did in science class while the enriched science students were at the science camp. While I wasn't able to observe first hand what the general science students did, I was able to look at Mr. Johnson's planning book for those days. I found out that on Monday of that week, Mr. Johnson planned to have the students draw and label pictures of the plants and animals found on various pages in Chapter V. This assignment was to be collected the following day. On Tuesday, Mr. Johnson planned to have the students list the major biomes and characteristics of some plants and animals on a biome characteristics sheet that he made. On Wednesday, Mr. Johnson went to camp and left the substitute the following directions. For Wednesday, the substitute teacher was to have the students read some articles in Science World magazine dealing with current science problems and some possible solutions. The students were also responsible for answering some questions about those articles. On Thursday, the substitute was to take the students to the library to get Reading Is Fundamental books, (a program designed to enrich one's love of reading) and to permit them to read for the last half of the class period. On Friday, the substitute was to have the students copy the first sentence of each paragraph (outlining) in chapter 5, as a review for the chapter 5 test coming up the following week (Reconstructed Fieldnotes, 4/10/91).

Upon my return from science camp, I informally asked a few students what they did the week I was away at camp. Five out of six students responded by saying, in one way or another, "We did boring stuff." (Fieldnotes, 3/12/89).

This section has shown another worthwhile experience that gave the students who participated a wide variety of opportunities to make observations, to analyze, classify, categorizing, interpret data, and to think about the subject matter etc.; that possibly helped build the relationship between the science students and their science teacher; and that was offered to the enriched science students but missed by the vast majority of general science students.

The Atmosphere

Earlier, Mr. Johnson's plan of moving certain students to the back of the room was discussed, and it was pointed out that plan appeared to have some unintended consequences related to Mr. Johnson and the students asked to sit in the back of the room. The following vignettes will illustrate how the number of students sitting in the back of the room increased over the school year and how their allegiance to each other and against Mr. Johnson grew.

Over the next few months, I kept an open mind about the notion that conflicts were developing between Mr. Johnson and the students sitting in the back of his fourth-hour general science class. I also checked to see if this same type of conflict was developing in Mr. Johnson's third-hour enriched science class. I found that

conflicts between Mr. Johnson and his third-hour enriched science students were rare, although Mr. Johnson did make one of these students sit in the back of the room as well. This student was Marty. Unfortunately, I wasn't present the day that Mr. Johnson moved Marty's seat. However, when I did notice Marty sitting in the back, I asked, "Yeah, Marty, what happened? Why are you sitting in the back of the room?"

"Oh, Mr. Johnson sent me back here for not doing any work."

"So what did he say?" I asked.

"He said, 'Why don't you sit back here? Maybe you can get more work done'" (Fieldnotes, 12/5/89).

A few days later, I talked to Mr. Johnson about Marty. He characterized Marty as having only marginal science skills. Quoting Mr. Johnson, "Marty is struggling in this class. I don't know how Marty got placed in the enriched science class, but it's unfair to Marty. He would do much better in the general science class" (Fieldnotes, 12/9/89).

Much later in the year, Mr. Johnson did make another student from this class sit in the back of the room. This student was Theresa, one of the enriched students who frequently talked excessively in class. Mr. Johnson warned her a couple of times about her excessive talking. When that didn't work, he would make her sit in the back of the room. However, Theresa always got good grades on her assignments, and I assumed that that was the reason her seat in the back was only temporary, lasting for one or two days, at the most a week. For example, after sitting in the back a

day or two, Theresa would raise her hand and ask Mr. Johnson for another chance to behave and show that she could keep quiet. Mr. Johnson would usually give her another chance, especially when other girls in the class coaxed him into it.

As stated earlier, the relationship between Mr. Johnson and fourth-hour general science students sitting in the back of the room was a completely different story. The students' numbers continued to grow, and so did their conflicts with Mr. Johnson. The following vignette illustrates this.

One day, when I entered Mr. Johnson's fourth-hour general science classroom, I noticed Mr. Johnson standing at the front of the room with his arms folded. After a few minutes, he said, "I'm still waiting for you people to settle down."

"Good luck," came a voice from the back of the room.

"Yeah, that will be the day," said someone else.

"You'll be waiting a long time," said Dan, although in a somewhat low and cautious voice.

Finally, after waiting for almost five minutes, Mr. Johnson asked the class to open their books to page 137. "We're going to do exercise A on that page" he announced.

"I did that already," Sam remarked.

"Yeah, I already turned that in too," Dan said in support.

"I don't think so," Mr. Johnson said continuing to present the assignment. As the class got ready to do the assignment, I noticed two students who were not paying attention to Mr. Johnson's instructions. They were busy writing notes to each other. Karen

wrote on a piece of paper, folded it, and, as soon as Mr. Johnson wasn't looking, placed the note on the floor beside her and used her foot to move it to the adjoining row. Doris, who sat two rows over, checked first to be sure Mr. Johnson was still not looking, then picked up the note. The same tactic was used by the two girls again, only in reverse. Their note passing went on for quite some time. Eventually, Mr. Johnson caught on to what happening, but he didn't appear sure of who was doing it. He asked Karen if she was involved, and Karen denied it. Finally, Mr. Johnson caught Karen in a position that she could not deny it. He looked down at his seating chart and said, "Karen, take your books and sit in the back."

"Why me?" Karen protested. "I wasn't the only one doing it."

"You were the only one caught," Mr. Johnson replied.

"That's not fair," Karen shouted as she stomped back to her newly assigned seat.

"That will be enough of that," Mr. Johnson said calmly. "I don't want to have to call you mother and tell her how you've been acting."

"Don't be calling my mother at work," Karen screamed at the top of her voice. "You've already got her in trouble calling her there. She doesn't want to talk to you. She already knows how you are; I told her!"

"I wouldn't call if you would do what you're supposed to," Mr. Johnson replied softly.

"Just don't call," Karen repeated again sharply.

Mr. Johnson, apparently trying not to let this get out of hand, replied calmly, "Just sit back there and do your work and I won't have to."

"I hate you," Karen proclaimed.

"I hate him, too," came another voice from the back of the room.

"I can't stand him either," said Dan in a low voice.

After this incident Sam raised his hand and asked, "Are these papers going to be graded?"

"Yes, we will be grading them at the end of hour," Mr. Johnson answered without looking up from his desk.

"These are going to be graded?" another student inquired. Mr. Johnson nodded his head. From the back of the room, another student said, "Did you say that these are going to be graded?" This question was asked again and again, evidently to bug Mr. Johnson.

When it became time to exchange papers for grading the assignment, I noted another common occurrence. Dan, Karen, and Sam worked it out so they received each other's papers for grading. Then, when Mr. Johnson read the correct answers, they simply wrote in the correct answers for their friends.

When it became time to hand the corrected paper into Mr. Johnson, an unfortunate thing happened, some candy fell out of the pouch Dan was wearing around his waist. Mr. Johnson noticed it and said, "Why don't you bring that up here," referring to Dan's candy.

"No, that's OK; I think I'll keep it," Dan replied, placing the candy that had fallen out back into the pouch and tying the pouch shut.

"Come on, bring it up here; I'll keep it for you until after school," Mr. Johnson requested softly.

"I wasn't eating it, so you can't take it," Dan stated defiantly.

"Yeah, he wasn't eating it," Steve said chipping in his support.

"That's right," said someone else.

This debate continued for several minutes. Soon, everyone in the room was looking to see what would transpire between Mr. Johnson and Dan. I felt an eerie tension developing between the students on Dan's side and Mr. Johnson.

Mr. Johnson walked back and stood next to Dan's desk. "Give me the pouch or go to the office," he said in an soft tone. Dan just glared at Mr. Johnson. After a minute or so, Dan gave the pouch to Mr. Johnson, but his debate about it continued.

"That's it-out! Out! Go to the office," Mr. Johnson shouted! Dan walked out the door.

"You can't get away with that," Sam said in support of Dan.

"Yeah, we'll sue," someone else shouted from the back of the room.

"That's not right. I bet you I wouldn't let him take my candy if I had some," Karen proclaimed.

Mr. Johnson obviously irritated said. "The school rule states that students cannot have candy in class, period. So just quiet down."

The students' remarks finally did stop, but I felt that this conflict had caused the tension between the students sitting in the back and Mr. Johnson to reach it's highest point of the year.

After this class, Mr. Johnson told me that he would have given Dan the candy back after school if Dan hadn't made such a big deal out of it. Now, he was going to let the office take care of it. "Well," I asked Mr. Johnson, "Dan seemed to have a lot of support from his friends, didn't he?"

"Yeah," Mr. Johnson replied, "I can't understand why they act that way. You know there are some students in here who never give me any trouble. It's the same ones all the time." (Fieldnotes May 2, 1989).

Mr. Johnson was right; it was the same ones all the time. And as the year progressed, that became even clearer. Most of the students who sat near the front gave Mr. Johnson very little trouble. These students always appeared to comply with Mr. Johnson's instructions. And in return, Mr. Johnson usually called on these students when he wanted to keep a discussion going or when he wanted a student to do a special favor for him, such as grade papers or run an errand. The students in the back of the room always appeared to cause trouble for Mr. Johnson. In addition, they appeared to be able to cause some of the other students in the

classroom to align with them (in relation to their participation in mischievous behavior against Mr. Johnson's authority).

The vignette presented here further illustrates my belief that Mr. Johnson' tactic of moving certain students to the back of the room appeared to have some unintended consequences. To make this clearer, I have included a copy of the seating chart as it stood near the end of the school year (see Figures 8 and 9). I have highlighted the students who frequently were involved in conflicts with Mr. Johnson. With this as an aid, I hope to show that the classroom appeared to be divided (with a few exceptions) into three groups. Those students who were frequently involved in conflicts with Mr. Johnson sat in or near the rear of the room (alienated group), those students who never were involved in such conflicts sat nearer to the front (academically motivated group), and the students who did not fit into either of these two categories were the students that I came to call the swing group. I called them the swing group because if incited by the students who sat in or near the rear of the room (alienated group), these students would support the activities of the students in the back of the room. Examples of this were found during the gum chewing escapade and during the pouch of candy conflict. From my Fieldnotes I identified seven other conflicts that members of this group of students supported in one way or another.

From my observations of Mr. Johnson's enriched and general science classes over the last few months of the school year, it was apparent that there was a difference between these two classes in

terms of the atmosphere of the class. This difference appeared to be related to the relationship that Mr. Johnson had developed with the third-hour enriched science students versus his relationship with the fourth-hour general science students. For example, when Mr. Johnson gave the enriched class an assignment, the students would do it without question. In fact, sometimes, I notice a few students, mostly girls, who would do all their work and volunteer for more. They would volunteer to answer questions in the book that were not even assigned. In such cases, according to most enriched students, special favors were subtly and indirectly passed to the entire class as a whole. For example, the class would be given fun assignments, like learning Morse code, or more opportunities to work in small groups. Perhaps this can be illustrated better by a vignette.

On one occasion, as Mr. Johnson was giving a lecture to the enriched science students on how the hawk population helps to keep the mice population in balance, Concetta appeared to be asking questions just to keep the lesson going. Mr. Johnson appeared to like students who asked a lot of questions because it gave him a chance to share his wealth of knowledge with the class. Concetta seemed to know this.

"In the book they use the term 'vole.' What is a vole?" Concetta asked Mr. Johnson.

Mr. Johnson replied, "A vole is any of the rodents resembling rat or mice. The only difference is that voles usually have shorter tails . . ."

After Mr. Johnson's extended interlude about voles, he continued with his lecture, which included graphing the hawk and mice populations, Concetta then asked another question, "What is a legend?"

Mr. Johnson answered, "A caption. You'll usually find it on all graphs. It explains what things on the graph mean. For example . . ."

After Mr. Johnson's extended interlude about legends, he again continued with his lecture, and Concetta continued to ask questions at the appropriate time. After this lecture, Mr. Johnson allowed the class to socialize quietly for the rest of the hour, which amounted to about five minutes (Fieldnotes, 1/13/89).

Student-teacher interactions such as these were important in developing a good relationship with Mr. Johnson and thus showed acceptable ways that students could exact some control over the direction of classroom activities and the atmosphere of the class. I observed these good-natured interactions between the students in the enriched science class and Mr. Johnson repeatedly.

From this and other sources of evidence presented later, I concluded that the enriched science students seemed to have a good relationship with Mr. Johnson.

In contrast, the students in the general science class appeared to have more conflicts with Mr. Johnson. The following vignette further illustrates this.

When Mr. Johnson gave the same lesson on the ecological balance of the hawk and mice, I counted four disturbances that caused Mr.

Johnson to stop the lesson and discipline students. Finally, Mr. Johnson turned to the class and said, "If anyone here doesn't like it in this class, let me know and I'll make arrangement to get you out to here. And this semester I'll be giving out more 4's and 5's in citizenship, and you know what that means--no Cedar Point trip."

As Mr. Johnson spoke, Steve answered, "I don't care, I don't want to go anyway." Mr. Johnson overheard his comment and said, "How would you like a point for talking without permission?" Other students then began mumbling negative comments, with the noise appearing to get out of hand. Mr. Johnson stood in front of the class with his arms folded and said nothing. After a few more minutes the classroom got quiet again. Mr. Johnson tried to restart the lesson, but the disturbance had apparently taken its toll on the class. Many students were now slouching in their chairs and not paying much attention to what Mr. Johnson was saying. I looked up at the clock. There were only five minutes left in the class period. Mr. Johnson made the students in the class sit quietly in their chairs until the bell rang. I thought to myself, "This class didn't get much work done today."

Near the end of the school year, I asked Mr. Johnson some questions about his relationship with the two science classes. The following is an excerpt from that interview.

R: Tell me how you enjoyed your year in the two classes?

T: I had about the best year I had in about 10 years this last year, primarily because of the two enriched sections that I had--super kids that were in there . . .

R: How did your students respond to the workload because you put a lot of work on them everyday. They were busy doing vocabulary or labs or readings.

T: The kids in the enriched section did not complain too much about the amount of work. The kids in the general section sometimes it seems with the smallest task they complain about it. I don't know how they expect to learn anything without doing some work. I can't figure that part out . . .

R: How would you describe your relationship with your third hour enriched science class and your fourth hour general science class?

T: I had a tremendous relationship with my third hour enriched science class. We tease each other, but if you are open and warm to them, they give it back. They are very good that way. My fourth hour general science class was my worst class this year. Kids were very slow. Many of them didn't care, they were disruptive. I did have some bright kids in that class but not many.

R: How do you think the students in your third hour enriched science class got along with each other?

T: The enriched kids had a good rapport with each other. They don't seem to have any trouble relating to each other.

R: And how did your students in your fourth hour general science class get along with each other?

T: They could be friends one day and enemies the next. They tattle on each other and put each other down . . .

R: Let me ask you about the kids in your fourth-hour science class. It seems to me that there was three groups of students in that fourth hour and I want to explain it to you. The classroom appeared to be divided (with a few exceptions) into three groups. Those students who were frequently disruptive sat at the rear of the room, those students who never got into trouble sat nearer to the front, and the students who did not fit into either of these two categories sat in the middle. This middle group of students I called the swing group. I called them the swing group because if

> incited by the students who sat in the rear of the room, these students would support the activities of the students in the back of the room. So that is how I saw the groups in that class. How do you feel about this assessment?
>
> T: Yeah. Pretty good assessment.
>
> R: So what do you do to try and reach the kids who sat in the back, the disruptive ones?
>
> T: I'm not really sure that there is much that can be done with them. You can suspend them from class, but that's a lot of paperwork and lots of grief on the teacher's part. And there is always some parent back there who thinks their child is perfectly legitimate, a perfect little angel and why are you picking on my kid. And so you get to a point where you think rightfully or not, if that kid wants to sleep let him sleep. And I kind of end up doing this--if the kid is doing something that is hurting just himself and not disturbing some other kid I just let him do it. I guess I'm a firm believer in letting them make the choice and they live with the choice they make which may or may not be right but that is the way I do it. I wish there was a better way . . . (Interview, 6/6/90).

Mr. Johnson's comments about the rapport he had with his two classes and the rapport that each class had with each other made me curious about the rapport between the students in the two science classes. My curiosity was cured the last day of class during the change of classes. I was headed to Mr. Johnson's third-hour enriched science class, when I heard a tremendous commotion in the hall. A large group of students had gathered to watch two boys slug it out. All I could see was the boys' bodies slamming into the student lockers on the side of the hall.

"Damn it, kick his butt," I heard as I struggled to move to the front of the crowd for a better look. As I got closer, I could see that it was Sam fighting another boy whom I did not recognize. I

could hear the other students rooting for the boy they wanted to win. It was clear that each boy had his own group of supporters. Then it hit me, I might be expected to break this thing up. Fortunately, I did not have to. A teacher pushed her way through the crowd and broke up the fight (Fieldnotes, 6/10/90).

When I got to Mr. Johnson's science class, the fight was the subject of the conversation between the students that day. I had no clue what the whole thing was about, but this is how Karen explained it to some students in her class.

"You mean they just started swinging at each other?" Cindy asked.

"Yeah," said Karen, "they've been at each other throats for days. It started in the office. John (whom I found out was a member of Mr. Johnson's first-hour enriched science class) was called to the office. Dan and Sam were already there. Sam called John a fag and John replied, 'You're just jealous because I've got a brain and you don't.' The next day, I overheard Sam and Dan discussing how they were going to 'get' John the last day of school. They tried to get John to fight yesterday, but he wouldn't. So today, I saw them arguing in the hall. That's when the fighting started."

I asked Karen if fights between enriched and general students were common. Her reply was that enriched students were always getting beaten up because they are so preppy (Fieldnotes, 6/10/90).

Clearly, I could now see that enriched and general science students coalesced into different social groups. Each group

appeared to have its own social norms and beliefs, through which they both interpreted and created their own world both inside and outside of the science classroom.

Students' Attitudes Toward Their Science Class

When I first started this study, I speculated that there might be differences in the attitudes of the students in the two classes toward their science class. To help me confirm this speculation, throughout the entire school year I periodically asked each member of the enriched and general science class as a whole to respond to structured questions relating to their attitudes towards their science. The students wrote the questions and their responses on a sheet of paper and I collected them. After reading all of their responses, I analyzed them and constructed tables of their responses to key questions that illuminated their attitudes toward their science class, concepts of themselves as a science learners, and perceptions of their science teacher. These tables were generated from the responses of all the students in each science class.

To illustrate the students' attitudes toward their science class, I asked the students to write responses to these questions: (a) "Science class makes me feel . . ." (b) "How did the grade you received this six weeks, 12/8/89, affect your attitude toward your science class?" (c) "How do you feel about being placed in an enriched or general science class?" The students' responses were coded and presented in percentages that are reflected in Table 1 (Appendix H).

The data in Table 1 show that a substantially higher percentage of general science students showed evidence of having less-positive attitudes toward their science class than did enriched science students.

To illustrate the students' concepts of themselves as science learners, I asked the students to write responses to these questions: (a) "Does being in enriched/general classes, such as enriched/general science, give you more or less confidence in your ability to compete with other students?" (b) "Why do you think you were placed in the enriched/general science class and not the general/enriched science class?" (c) "As a Loran science student, do you see yourself as above average, average, or below average?" Again the students' responses were coded and presented in percentages that are reflected in Table 2 (Appendix I).

The data in Table 2 show that a substantially higher percentage of general science students show evidence of having less-positive concepts of themselves as science learners than did enriched science students.

To illustrate how students felt about their science teacher, I asked the students to respond to these statements: (a) "The teacher treats all students fairly." (b) "The teacher uses the discipline code fairly." (c) "Ideas and opinions of students are treated with respect." The students' responses were coded and presented in percentages that are reflected in Table 3 (Appendix J).

The data in Table 3 show that a substantially higher percentage of general science students showed evidence of having less-positive

feelings about their science teacher than did enriched science students.

Before I use the data in these tables to interpret the findings I want to make clear the limitations of this data. Although I can say that these findings represent whole class views and not merely individual views, some things I asked about, such as how they saw themselves as Loran science students, why they thought they were placed in an enriched or general science classes, and possibly others, are attitudes that probably developed over a long period of time. Thus, my data could not help us be certain about the role of placement in the development of these long-term attitudes. The data lacked the necessary controls and the longitudinal information about these attributes in students needed to make these conclusions. In spite of these cautions, patterns emerged that allowed me to begin to interpret students' attitudes within the two classes.

What I could determine from the data in these tables is that different kinds of attitudes tended to cluster around certain placement groups. In other words, students with similar kinds of attitudes seemed to be in the same science class. In other words, I found that student attitudes in the enriched science class and general science class clustered in the following patterns. Students in the enriched science class had substantially more positive concepts of themselves as science learners than general science students did. Students in the enriched science class had substantially more positive feelings about their science teacher than general science students did. And students in the enriched

science class had substantially more positive attitudes towards their science class than general science students did.

To strengthen and substantiate the data in the tables, I conducted interviews with each member of my target group. In these interviews I asked the target students about some of the responses they wrote to my structured questions.

In the interview that I had with Dan and his parents, I asked Dan about his written response to one of my questions. When asked to complete the statement, "Science class makes me feel . . . , Dan responded, ". . . like it's a waste of time because all I want to do is be a basketball player" (Question asked 10/24/89). The following is an excerpt from that interview that I had with Dan and his parents.

R: . . . one thing that I want you to respond to is the question that I ask you on 10/24/89. "Science class make me feel . . . " Your response to that was, ". . . like it's a waste of time because all I want to do is be a basketball player." Tell me about this response?

D: You know what I mean, I don't see why we have to learn that stuff. It's boring and it has nothing to do with what I want to be.

M: You better start taking your class seriously or you'll never amount to anything.

F: I don't see where it makes any difference. That school is worthless anyhow, what do you expect the boy to do?

R: Why do you feel the school is worthless?

F: Because I pay taxes and all I can see those teachers doing is sitting on their asses, most of the time anyway. They never sent home any homework but they are always complaining about how hard their job is. (Interview conducted 3/15/90).

There was a very important message in Dan's perception of his science class. That message was that his science teacher was not teaching anything of value to him. In addition, Dan's father's comments showed how he felt about Dan's teachers and school. Dan's father felt that most of the teachers at the school did very little, and the fact that they rarely sent any homework home with Dan proved in his mind that most of them did very little.

In the interview I had with Sam and his parents, I asked Sam about his written response to the same question asked Dan: "Science class makes me feel . . ." Sam responded, ". . . unhappy because of my grades" (Question asked 10/24/89). The following is an excerpt from that interview that I had with Sam and his parents.

R: . . . do you remember when you were coming into your class, do you remember seeing that leaf collection stuff that the enriched kids were doing?

S: Yeah.

R: Now that is something that your class didn't get a chance to do. Would you have liked to have done that?

S: Yeah, because I thought that would be better than writing out a whole chapter out of a book. To bring in some leaves and examine them and stuff like that.

R: How do you guys (referring to Sam's parents) feel about something like a leaf collection project and one class having an opportunity to do it and the other class does not?

M: I can see what Sam is saying, the enriched class, it sounds like they were doing scientific things where Sam's class was doing more book work and really benefit in science as far as like the leaf collection. I know he would have enjoyed it, he

has done stuff like that in the past, he is very (outdoorsy) anyhow and I think that he would have enjoyed it.

R: And the science camp, remember when he (Mr. Johnson) talked about that? Why didn't you go?

S: Because I knew Mr. Johnson was going and I thought it was too much stuff for that week.

R: So you thought that to sell candy and stuff like that, you had to sell 50 boxes or something like that, it was too much just to go for a week? And the fact that Mr. Johnson was going to go, too, did that have any effect?

S: Yeah, probably most of it. I still don't care for Mr. Johnson. I run into him in the halls and stuff, because me and my classmates we had a group and we would go up to the library and he (Mr. Johnson) would follow us up there to make sure we were going up there.

R: Why do you think that only one kid out to your whole class went to camp?

S: I would rather do the routine work than go to the science camp because Mr. Johnson was up there for a couple of days.

R: I want to just read some of the responses you had on some of these questions. "Science class makes me feel. . . " And you put down, ". . . unhappy because of my grades." Tell me about that?

S: Yeah, every paper I turned in was a C or lower and I couldn't understand it because I guess because he said (Mr. Johnson) my penmanship or I didn't state the words correctly and he was marking me down for that (Interview conducted 6/16/90).

Sam appeared to have a negative perception of his science class. He felt that they did all book work and nothing exciting. Sam's mother could see Sam's point and felt that he might have done better if more exciting things were offered. Sam didn't like Mr. Johnson. He felt that Mr. Johnson did not trust him and appeared to mark him down for things that were not related to science. His

dislike for Mr. Johnson appeared to get in the way of his decision to go to camp.

In the interview I had with Kathy and her mother, I asked Kathy about her written response to one of my questions. The question was, "How do you feel about being placed in the general science class?" Kathy responded, "I think I should be in enriched because in my last year's classes I got all "As" except for one" (Question and response done 9/14/89). The following is an excerpt from the interview that I had with Kathy and her mother.

R: . . . Kathy, why did you answer this question this way? How do you feel? Do you want to be in enriched science?

K: [Shaking her head to indicate, 'No.'] Most of the preppies are in there. They act like they are . . . [Kathy's mother stops her from saying more].

R: No, I want to hear it. They act like they are what?

K: So goody-two shoes. Like they are everything because they are in enriched science class.

R: How does that make you feel? Putting some kids in enriched and putting other kids in general?

K: They should give people a chance. They don't know what they can achieve until they give them a chance.

R: Do you think when they separate like that it allows kids to be "preppy?"

K: Yeah.

R: And how do you (referring to Kathy's mother) feel about that?

M: I think that it causes a real danger for the ones in the enriched class looking down on the others ones as not being as smart as they are. It is a definite tracking problem when you start getting into that (Interview, 6/15/90).

In the interview I had with Steve and his mother and father, I asked Steve about his written response to one of my questions. When asked to complete this statement, "Science class makes me feel . . .," Steve responded, ". . . bored unless I am doing labs" (Question asked 10/24/89). The following is an excerpt from that interview that I had with Steve and his mother (M).

R: . . . on 10/24/89, I asked you this question and asked you to fill in the rest. You wrote, bored unless I am doing labs. Can you tell me what that means and why labs are exempt from being boring?

S: Because you get to work with your friends and you get to share ideas and you get to talk and look in the microscope and study different stuff and the work that we do is just book work and we can't talk to anybody.

R: What do you mean book work?

S: You have to write the first sentence of each paragraph or.

R: How do you feel about writing the first sentence of each paragraph?

S: It is boring doing that because there is a lot of paragraphs. It would be like 40 sentences.

R: And so you saw that as what?

S: Boring work.

R: Labs you didn't see as boring work. Is that correct?

S: Yes.

R: You saw that as?

S: Something fun that you get to do.

R: . . . were you happy with the grade that you got in science?

S: No.

R: What would you say about it?

S: The grade that I got?

R: Yes, after you got it, how did you feel.

S: Mad and discouraged because that meant that I had to repeat seventh grade.

R: How did you feel about your science class?

S: Made me dislike it more.

R: . . . how would you characterize your sons experience in his science class?

M: Traumatic. Meaning that he was discouraged to the point where he didn't even want to try and I know his capabilities of doing the work were good.

R: He shared that with you?

M: Yes.

R: Upon hearing about this how did that make you feel?

M: I questioned the way the class was being taught. I spoke with the counselor and the counselor in turn spoke with the teacher. They were saying that Steve could very well do the work, but that he wasn't trying. Many times I know that it is the way that the subject is presented to the student. If you can't present a subject to a student where it would get their attention right off the bat, you lose them. It has to have interest to them. Even science which some kids think is boring. If it is brought to them in a way where they could enjoy that class, they would get a lot out of it.

R: Did you share this with the counselor and the teacher? Did you talk over the phone or have a conference?

M: Yes, I went to the school. His response was well let me look at Steve's record. He responded that Steve is a very bright student and we just think that if he works a little harder at it, it won't be a problem. But at the same time knowing Steve's capabilities, they seem to overlook that, yes he can do it, but there is a problem and a reason why he isn't.

R: . . . you mentioned to me that you weren't aware that there are two different science classes. One enriched and one that is general. Now that you know about it from me, what are your thoughts on that?

M: My thoughts is who determines that the students is general and who determines that the student is enriched. What are the recommendations based on?

R: Knowing that your child was put in general science class how does that make you feel?

M: It makes me feel that he has been slighted because I know that he is a bright child.

R: What do you think about that fact that they didn't inform you that there are two different levels?

M: I think that they have taken education into their own hands and they are teaching and dealing with the problem the way that they think it should be dealt with without the parent even being considered. Why is it that my child is there, and why is it that the parents are involved after the fact. After the problem has gotten so far that your child fails (Interview done June 3, 1990)?

In the interview I had with Mary and her mother, I asked Mary about her written response to one of my questions. The question was, "Does being in general science, give you more or less confidence in your ability to compete with other science students and why?" Mary responded, "It gives me more confidence because I can get easy A's; the people I know that are in enriched classes don't get A's a lot" (Question asked 11/28/89). The following is an excerpt from the interview that I had with Mary.

R: The first question that I want to interpret is this question that I ask you on 11/28/89. "Does being in general science, give you more or less confidence in your ability to compete with other science students and why?" Your response to that was, "It give me more confidence because I can get

easy A's, the people I know that are in enriched classes don't get A's a lot." Tell me about this response.

M: The friends that I have are in enriched and they got B's and C's and I was in general science and it was easy for me to get A's.

R: So it was easy for you to get A's so being in general science was what?

M: It wasn't hard.

R: Was it challenging?

M: No.

R: Did you enjoy not having the challenge and getting the easy A's?

M: Sometimes. Sometimes it got a little boring too.

R: I guess the next. What I want to ask about is how important is the grades to you?

M: It is important because like if you get bad grades, it closes the door.

R: . . . would you say that kids that are in enriched science class think that they are smart and kids that are in general science class don't?

M: Yeah, some of them. Not all of them.

R: Talk about that. What does that mean. Your comment there. Yes, talk about that.

M: Well they just act smarter or something.

R: Act smarter, explain what you mean by that. To who, or when? Give an example.

M: I don't know.

R: You said that they act smarter. What did you mean by that?

M: They are just sort of nerdy, but not....

R: Who is?

M: The kids in enriched classes.

R: Who says that they are nerdy? Is this something that enriched kids say of themselves, or is this something that someone else says?

M: General science classes say that they are nerdy.

R: The general science class says that the enriched class is nerdy. And what do the enriched kids say about the general science kids?

M: I don't know. They don't really talk about it.

R: They've never talked about it?

M: No.

R: . . . Mary, would you say that when class is going on, there are kids in your general science class that always seem to distract Mr. Johnson. They make noises or whistle or try to disrupt class. Do you notice that?

M: Yeah.

R: How do you feel about being in a class where students do that kind of stuff?

M: It doesn't bother me.

R: It doesn't bother you. Would you like to be in a class where everybody was trying to learn and not trying to disrupt learning?

M: Yeah.

R: Do you think there is a problem with your science class?

M: Yeah. It is really boring.

R: Why do you think it is boring?

M: Uh, (long pause) I'm not learning too much.

R: Would you like to be in enriched science class?

M: Yeah . . . (Interview, 6/30/90).

Thus, for Mary, being in an enriched science class meant being part of a different group of students, the preppy or nerdy group. Mary made another thing clear. Enriched science students, she explained, are considered good in science, while most general science students are not good in science. But, while the notion of being an enriched science student meant being thought of as "someone good in science," it also meant something unappealing to this general science student--being a preppy or a nerd.

The next interview was with Erin. Erin's written response to the question "Science class makes me feel . . ." was, "Science class makes me feel sort of smart, because I am so good at it. Sometimes I don't like it" (Question asked 10/24/89). The following is an excerpt of the interview with Erin.

R: What is your present attitude toward science class?

E: Well to me science is really fun, but it just depends on what subject you are doing and how you're doing it. This year I haven't really done anything all that interesting but I still think science can be fun.

R: What kind of things do you think could be more interesting for you to do in science class?

E: Well, I like to do experiments more with things instead of like reading out of the book and doing little things. I like to experiment. So I want to know more about what I'm dealing with. I would like to know more than the book. The book is all right and everything but I like things that are more fun and interesting.

R: How has the teacher affected your attitude toward science this year?

E: He hasn't really affected my attitude, he didn't really make it interesting because he didn't deal with a lot of stuff but, I like science I don't really worry about the teacher or the class or anything. I just like to deal with the subject and ignore everything else. So the teacher didn't really affect science class for me very much.

R: Did you have this attitude prior to coming to this class?

E: Yes, because my teacher in 6th grade, she made us do work on our own and made it fun for ourselves so like if it is not fun for you then you can put it in your head and make it fun or something instead of looking forward for the class to make it fun. When you get home you can probably do exercises on your own.

R: So do you think that when you go to High School that you'll take more science classes than required or when you go to college will you pick a science career?

E: When I go to high school, more than likely I might pick more science classes than required because it is fun to me, but I will pick other classes that I need like English and Math and whatever but in college I don't think I would pick science because that is not the subject that I'm going into.

R: How do you think being in the enriched class versus being in a general class has affected your attitude toward science?

E: The difference hasn't really affected my attitude toward science because to me no matter whether you are in general or enriched, you should still have the same attitude about science or whatever subject. You can still do the same things in both classes. So the difference doesn't really affect me (Interview conducted 6/3/90).

The next interview was with Concetta. When I asked her to respond to the question, "Does being in general science give you more or less confidence in your ability to compete with other science students and why?" her written response was, "It give me more confidence because it helps me know that I am smart enough"

(Question asked 11/28/89). The following is an excerpt from the interview that I had with Concetta.

R: Concetta how has this year's science class effected your attitude toward science?

C: It has taught me a little bit more, but it hasn't really changed my attitude because I have always liked science. I think that is mostly because when my Dad was in high school he worked at Loran Nature Center and he taught me a lot about it. About wildlife and everything. I have always liked wildlife.

R: Is your dad a professor?

C: No my dad is a lawyer.

R: . . . it sounds like you have plans when you go to college or after college to be in a science related career. Is that correct?

C: Yes, I want to be a marine biologist.

R: How did you come to this decision?

C: Well I used to want to be an entomologist, but I sort of got sick of bugs and stuff and I have always been interested in fish and mostly I like whales and sharks. I am being a teen zoo keeper this summer at Potter's Park zoo this summer.

R: When do you start that?

C: I took classes last weekend and I am taking two more classes this weekend and I just do it through the whole summer.

R: How did you get involved with that. Did someone come up to you and ask you to do it?

C: My friend Janet were talking about it and then she got three applications and she asked me if I wanted one, and I said yes. I filled out the application. I had to have my science teacher write me a letter of recommendation. Which he did.

R: Mr. Johnson wrote you a recommendation?

C: Yes. Then we sent it in and I just started going to classes.

R: Great. What has this year's science class provided you with?

C: It has just mostly given me more knowledge about the outside world.

R: Have you enjoyed this year's science class?

C: Yes. Everyone goes, "Concetta how can you like science." I just do.

R: Do your friends say that to you?

C: Yes. Some of my friends.

R: Do you get a lot of parental support?

C: Yes my parents always encourage me to do well in school and it is weird, but it just comes easy for me. I have to work a little bit in English once in a while because it sometimes is hard for me, but I have pretty much always done well in science (Interview conducted 6/3/90).

The following is an excerpt from the interview I had with Marty.

R: Marty, what is your present attitude about science class now that it is at the end of the year?

M: I like to go to this class because we learn more stuff.

R: What grades do you get in science class?

M: B's mostly, I've got three A's and the rest B's and C's.

R: What do you think would happen if they put you in general science class? Would your attitude toward science class change?

M: Yes, because being in an enriched science makes you work harder.

R: What other things in this class have helped shape your attitude toward science class?

M: I don't know.

R: Did the activities you went on and stuff like that help?

M: No, just being in the enriched class makes you work harder.

R: Are all your classes enriched?

M: No, this is the only one I've got.

R: And you really like it?

M: Yeah, I guess. I don't like science so I don't know how I got into it.

R: You don't like science?

M: Its not my favorite subject, but its not my worst.

R: Do you like it though?

M: Yeah, I guess. It is more demanding than other stuff.

R: . . . if you get to pick your career, would you want it to be in science?

M: No, I want to be a sports broadcaster . . . (Interview conducted 6/3/90).

When I asked Theresa to response to the following, "How do you feel about being placed in the general science class?," her respond was, "I feel very smart" (Question and response done 9/14/89). The following is an excerpt from the interview that I had with Theresa.

R: . . . so how long have you been in enriched science?

T: Just this year.

R: What were you in before that?

T: Regular science with Mr. Woody.

R: So what made you able to move from general science to enriched science?

T: I don't know, I think I got an A last time in science.

R: So you got an A last time and that kind of pushed you up?

T: B's mostly.

R: What do you think was the difference in your general science class and what is it like in your 7th grade enriched science class?

T: Right now it is more work than its been in 6th grade cause in 6th grade we didn't do that many things. Mr. Woody didn't do as many things as Mr. Johnson.

R: Anything else besides just the work load?

T: We didn't do any lab or anything like that, it was mostly boring things.

R: Do enriched and general students think about their work differently?

T: Yeah, they seem more dedicated to it.

R: Which students?

T: The enriched, they seem more interested in it and in regular class they don't really think about it.

R: So how would you feel if they put you back in general class?

T: I don't know. I would probably feel kind of mad because I wanted to be in enriched all the time (Interview conducted 3/8/90).

The responses of the enriched science target students seemed to suggest that they had more positive academic attitudes toward science class ("I'm good in science") than the general science target students. This is not surprising, considering they were told by their school, their teacher, and other students that they were smarter in science. It was especially interesting to note the difference in general self-concept. Enriched science target

students appeared to have a more positive self-concept of themselves and their abilities not only in academic subjects, but in general as well, than did general science target students.

Unlike the tables that represented whole class views, these interviews do not gauge attributes of the classes themselves, but rather attitudes of a few individuals in those classes. My intent was to use these interviews to support the findings from the tables. While it is likely that from these interviews one might infer some things about how the students in the different science class attitudes differed, no conclusions can be drawn from this data alone.

Summary of Chapter 4

Some of the key differences between Mr. Johnson's enriched and general science classes that I found during this study were related to the differences in the experiences that the students in these classes had. For example, the enriched science class was assigned more academic tasks that allowed them to think about subject matter, while the general science class was frequently assigned tasks that did not require much thought about subject matter. The enriched science class was allowed to work in small groups more frequently than was the general science class. The enriched science class was provided more opportunities to engage in special activities (leaf collection, science camp, morse code, etc.) than was the general science class. The enriched science class worked in an atmosphere that was cooperative, nurturing, and not disruptive, while the

general science students worked in an atmosphere that through time became frequently uncooperative, alienating, and disruptive.

Another key difference found was in the perceptions held by school personnel and students in relation to the behavior and academic ability of the students in these two classes. Generally, the students in the enriched science class were perceived as academically capable of doing the work, committed to doing the work, and cooperative when asked to do the work. On the other hand, the majority of general science students were perceived as less academically capable of doing the work, uncommitted to doing the work, and uncooperative when asked to do the work.

Another difference was seen in the commitment students in the two classes place on completing academic assignments and doing well on them. Enriched science students appeared committed to completing their assignments and doing them well, while only a small group of general science students appeared equally as committed. This commitment was reflective in the grades they received on assignments.

The most central finding was the contrast between the relationship that developed over time between the students in the two classes and the teacher. The relationship that developed between the teacher and the students in the enriched science class appeared cooperative and respectful of each other. The relationship that developed between the teacher and the students in the general science class was such that social groups appeared to strengthen. One group of students (academically motivated group) appeared to

developed a cooperative relationship with the teacher. Another group of students (alienated group) appeared to become alienated towards the teacher. The third group of students (swing group) appeared to swing between being cooperative and alienated towards the teacher. The social groups that developed within the general science class also appeared to have different relationships with other students in and outside their own science class. The group that developed a cooperative relationship with the teacher appeared to resent what was happening in their class because they felt it interfered with their learning; thus they did not support the disruptive students in their class. The alienated group felt that the students who were always cooperative in class were, in a way, selling out. They referred to them as goody-two-shoes or preppies. The swing group appeared sometimes to support the alienated group and at other times to support the cooperative group. The enriched science class did not appear to have different social groups within their class; although, they did seem to view some general science students as uncooperative and/or not committed to the doing their work in class.

The teacher perceived the two classes differently, and what happened in the two classes appeared to supported his beliefs. In the enriched science class, the students were cooperative and committed to getting their work done. In the general science class, some of the students were cooperative and committed to getting their work done; however, the majority of them appeared at times to be uncooperative and/or not committed to getting their work done. As a

result of what was transpiring in the general science class, the teacher came up with strategies that he felt would help the situation in the class. These strategies were academic as well as classroom-management related. However, these strategies appeared to have some unintended consequences that contributed to the development of social groups within the teacher's general science classroom. In particular they contributed to the spacial separation and increase in the size of the alienated group.

The Dilemma

From the evidence presented in this chapter, it appeared that policy makers and teachers felt trapped between two options, both of which had undesirable consequences. Those two options as perceived by the teachers and the district policy makers at Loran were: keep the current the placement policy and have a quality experience in science for a small, homogeneous group of science students (the enriched science students), and have teachers do the best they can with the majority of science students (the general science students), risking the possibility that the general science students won't have a quality experience in science because the heterogeneous make up of the students in general science classes might make it difficult for teachers to accomplish their goals. Or, abandoned the placement policy and have teachers do the best they can with the heterogeneous group of all the science students, risking the possibility that no science students will have a quality experience in science because the heterogeneous make up of all the science

students might make it difficult for teachers to accomplish their goals.

Let's look at how this dilemma manifest itself by examining the situations facing the various participants in relation to the placement policy at Loran. The participants are: district policy makers, school administrators, the assigned teacher of enriched and general science classes, parents of enriched and general science students, and students placed in either enriched or general science class.

It was decided by the policy makers that some Loran science students possessed the potential for handling a more rigorous workload in science. Therefore, the policy makers decided to create enriched science classes for these students. The idea was to provide enrichment activities for the students' assigned to these classes and that this might further motivate these students in science. These enrichment activities would be more rigorous than activities usually presented in general science classes. The policy makers decided to set up some criteria for selection of science students into these enriched science classes. The selection criteria chosen included: (1) having the science students score at least 90% on the Stanford Reading Achievement Test, (2) having 6th and 7th grade teachers identify and recommend students who they feel have a special talent in science, for enriched science classes, and (3) allowing parents to overrule any decision concerning where their child is placed.

The position taken by the Loran district policy makers [that justifies the placement policy] was that they apparently believe: (a) students learn better in groups where students are academically similar, (b) teaching is easier when students are grouped homogeneously, (c) the established procedures for identifying student's placement are both fair and accurate.

As a result, policy makers at Loran instructed administrators at Loran to place students into either enriched or general science classes, according to the established placement policy. An unfortunate realities of the placement policy was that parents of science students at Loran can have input as to where their child is placed. However, from the interview I had with the principal of Loran, Mr. Bird, very few parents exercise that right. Another unfortunate reality that I found in the placement policy is that students with a history of being behavioral problems in the classrooms are placed in general science classes. These students (I will call henceforth, entering alienated students) are not recommended by their 6th grade teacher into enriched science classes, nor do they score in the 90th percentile on standardized achievement test. Interviews with teachers who had taught general science classes in the past suggested that it was quite common that two, three, or sometimes as many as five students with histories of being behavioral problems in the classroom, would end up being placed in a general science class.

The situation facing the administrators at Loran is that they must implement the established placement policy. They must give the

Stanford Achievement test to the students, make sure that 6th grade teachers give them a list of students that they feel should be placed in enriched science classes, and respond to any request for placement of their child by parents. The administrators must also determine which teachers will be chosen to teach the enriched and general science classes. For that particular year, the teacher chosen to teach the enriched science classes was the science department chairman, Mr. Johnson. The administrators expected that Mr. Johnson would do some enrichment activities with his enriched classes.

The situation facing Mr. Johnson, having been chosen to teach the two enriched science classes offered by the school, as well as two general science classes was how to teach the two types of science classes, knowing that they would contain different types of science students in term of academic and behavioral readiness. This challenge caused him to come up with teaching strategies that he felt would address the academic and behavioral needs of the students in the two type of science classes.

The situation for the parents of students chosen for enriched science classes [was such that they] felt that the placement was done by reliable means and therefore, viewed the placement of their child into general science classes as appropriate. Enriched science students' parents liked the idea that their children were being placed in science classes that would in some way be enriched. In fact, when the school considered abandoning the placement practice,

many parents of enriched science students lobbied district policy makers to insure that the placement practice continued.

The situation for the parents of students chosen for general science classes either: (a) did not know that there were two types of science classes (enriched and general), because nothing was sent out by the school informing them about it (and did not know the method of placement), (b) knew that there were two types of science classes (enriched and general), yet felt that the placement was done by reliable means, and, therefore, viewed the placement of their child into general science classes as appropriate, or, (c) knew that there were two types of science classes (enriched and general), but felt that the placement was done by unreliable means, and, therefore, felt the placement of their child into general science class was just another policy that exemplifies how the system is unfair.

The perception for the students chosen for enriched science classes was that they were placed in an enriched science class because they either scored 90% or better on the Stanford Achievement test and/or were recommended by their 6th grade teacher (parent recommendations into these classes are rare). Mr. Johnson's strategies for addressing the academic and behavioral needed of enriched science students revolved around the make-up of these students and how he perceived their abilities (a homogeneous group of academically motivated and cooperative students). This resulted in Mr. Johnson giving enriched science students more time to develop academic skills, such as outlining skills. He also gave them more

opportunities to participate in hand-on activities, such as the leaf collection project. Additionally, because of their cooperative behavior, enriched science students received more opportunities go places were the teacher could be seen in a different light, such as the science camp.

The perception for the students chosen for general science classes was that they were placed in a general science class because they either did not score 90% or better on the Stanford Achievement test and/or did not get recommended by their 6th grade science teacher (parent recommendations into these classes are also rare). Mr. Johnson's strategy for addressing the academic and behavioral needs of general science students again revolved around the make-up of these students and how he perceived their abilities (a group of students with different levels of academic and behavioral skills). This resulted in Mr. Johnson giving general science students fewer opportunities to develop academic skills because he felt he needed to spend more time on behavioral skills. Those academic skills that were developed were many times oversimplified, such as the skill of outlining a chapter. Mr. Johnson also gave general science students fewer opportunities to participate in hand-on activities because Mr. Johnson felt that many of the general science students couldn't handle the task academically or wouldn't want to do the task even if given the opportunity, such as the leaf collection project.

And, in an attempt to combat behavioral problems in classrooms and on field trips, the school district come up with a strategy that prohibited students, who received 4's and 5's in citizenship from

any class, from going on field trips. This had an effect on a large number of general science students because of their uncooperative behavior, including students in Mr. Johnson's general science class. Thus, many general science students received fewer opportunities to go places where the teacher could be seen in a different light, such as the science camp.

These strategies for addressing the academic and behavioral needed of enriched and general science students contributed to general science classes becoming somewhat impoverished when compared to enriched science classes.

Now that we have examined the situations facing the various participants as a result of the placement policy in place at this school, what can be said about the dilemma facing the policy makers and the teacher?

When the placement policy was instituted, teachers of enriched science classes expressed that it was nice having a homogeneous group of academically motivated and cooperative science students. On the other hand, many teachers of general science classes expressed that the placement policy took out the best students, leaving their general science classes with poor role models.

On the hand, throughout the United States cries from some civil rights leaders and politicians have argued that practices such as the Loran placement practice, are just another form of tracking students into high or low ability groups. In interviews with some parents I obtained comments from parents expressing their belief that the Loran placement policy was merely just another form of

tracking students that shows that the system is unfair. The perceived dilemma for the district policy makers heighten when they voiced their consideration in abandoning the placement practice. Upon hearing this consideration, many parents of enriched science students demanded that the policy makers continue the placement practice. Some of these parents went so far as to apply pressure, through lobbying the policy makers, to ensure that the placement practice continued. These parents of enriched science students voiced their belief that, if their children didn't have a separate experience with other highly academically motivated and cooperative students, then, their children would not have the quality education in science that they deserve.

Parents of general science students, to my knowledge, never voiced their belief to the policy makers that their children were not getting the quality education in science that they deserve because their children were not getting the same kind of enrichment activities. However, in conversations with me that feeling was expressed by some parents of general science students.

So, the perceived dilemma for district policy makers became, keep the placement policy and have a quality experience in science for a small, homogeneous group of science students (the enriched science students) and do the best you can with the majority of science students (the general science students) but risk the possibility that the general science students won't have a quality experience in science because the heterogeneous make up of the students in general science classes (especially the two or three

entering alienated science students) might make it difficult for teachers to accomplish. [However, you quiet the most vocal group of parents.] Or, abandon the placement policy and do the best you can with the heterogeneous group of all the science students and risk the possibility that no science students will have a quality experience in science because the heterogeneous make up of all the science students (especially the two or three entering alienated science students) might make it difficult for teachers to accomplish. [However, you now have a vocal group of parents lobbying against your decision.] Confronted with this dilemma, the policy makers chose to keep the placement practice.

The perceived dilemma facing the teacher became, if you try to do the same enrichment activities that you do in the enriched science classes, in the general science classes, then problems created by the placement policy, in terms of the make up of the general science students, creates management problems for the teacher. At the same time, if you don't do the same enrichment activities in general science classes that you do in enriched science classes, then you leave the most needy students with a possible impoverished educational experience.

There is little doubt that Mr. Johnson would have wished that the make up of the students in his general science class were more like his enriched science class, [mostly a homogeneous group of cooperative, academically motivated students]. Then he could have provided enrichment activities for both types of classes [enriched and general]. However, the school's placement policy made that an

impossible reality. Instead, the heterogeneous make up of the students in Mr. Johnson's general science class, in regard to academic capabilities and behavioral skills, resulted in the development of social groups (academically motivated group, alienated group, and swing group) within his general science classroom itself. The development of these social groups became problematical for Mr. Johnson. It appeared that the two or three (entering alienated) general science students capitalized on the dynamics of the situation by inciting other students (swing group) into disruptive behavior, thus contributing to increasing the size of the alienated group as the school year progressed. In addition, the classroom management strategy of the teacher (changing seating arrangements), only reinforced the formation of a larger and larger disruptive group of students (alienated group).

Thus, the choice for the teacher seem to be, try to do the same enrichment activities that you would in enriched science classes, in general science classes and put up with the management problems caused by entering alienated students in general science classes, or, only do the enrichment activities in the enriched classes and leave the general science students with a possible impoverished education experience, however, you won't have to put up with the additional management problems that might arise. Mr. Johnson apparently chose the latter.

CHAPTER V

A FRAMEWORK FOR INTERPRETATION: SOCIAL BONDING THEORY

I would like to begin this chapter by admitting that I struggled with choosing the appropriate frameworks to use to help me interpret my data. At first I thought about using a Marxist point of view because the analysis of how schools contribute to the social reproduction of an unequal society has fascinated me, and upon analysis of my data I found many parallels. I also thought about using the literature on teacher's expectations because, again, upon analysis of my data I found many parallels. While I feel that both of these frameworks might have been appropriate and useful, they didn't appear to highlight the central focus of what I saw happening in the two classes.

I selected social bonding theory because it was particularly appropriate for capturing and illuminating what I understood was going on in these two classes. A gulf appeared to develop between the teacher and the students in the general science class. In the enriched science class, the teacher and the students appeared to work together and developed a good relationship. Social bonding theory provided me with a language that I could use to talk about these phenomenons that I saw. Furthermore, the idea of a social

bond and its elements were suggestive of the mechanism that took place in these classrooms, and that mechanism made sense with my analysis, fitting the picture that I was trying to paint. In that sense, it helped me show how these processes came about, not merely that they came about. This model also led me to look further at things that the model pointed to. While it might be true that social reproduction and teacher's expectation were part of what was happening in this setting, they didn't address the central focus as well as social bonding theory.

Since the idea of a social bond is pivotal to the conception of youth conformity and deviance, let us begin by examining what a social bond is in Hirschi's (1969) context. According to Hirschi a social bond is both a psychological (perception or attitude) and a social condition (situation). For example, the perception that it is possible to do well in science class is a psychological factor, while the situation of being regarded or treated well by a science teacher is a social one. Social bonds are associated with social settings and persons in them and can be established and maintained through interaction with others. Hirschi warns that it would be an error to regard the bond as something that can be internalized in the child once and for all. Since social bonds are founded in the situation, they are changeable with the situation.

In Hirschi's view, most young people generally honor rules, broadly defined, because they have formed social bonds with conventional persons (e.g., teachers) in the course of conventional activities. Social bonds are sustained by an ongoing realization of

various values or goods that can be obtained from human interaction, such as excitement, acceptance, competence, or fairness. Thus, it is inferred that things like "opportunities, skills, and reward" might promote bonding and thus promote order in the classroom.

With this in mind, the following model was developed from a multi-year study by Elliott, Huizinga, and Ageton (1985). Using that model, the conclusion depicted in (Appendix K) was reached.

What the researchers concluded was that after taking into account their subjects' initial rates of delinquent behavior, the strain between aspirations and opportunities, lack of opportunity, inadequate socialization, and social disorganization all contribute to weak conventional bonding between children and their families and schools. Those weak conventional bonds, along with lack of opportunities and social disorganization, free youth for participation in peer relations, strong bonding to delinquent peers, that support delinquent behavior.

Relying on re-analyses of several studies of delinquency, Weis and Hawkins (1981) constructed a similar synthesis of theories to support the derivation of strategies for preventing juvenile delinquency (also see Hawkins & Weis, 1985) (Appendix L).

These researchers argued that when children are provided opportunities for conventional activities, are enabled to attain the skills needed to take advantage of those opportunities, and receive rewards for their participation, they tend to become involved in conventional pursuits, e.g., school activities. From those involvements, they form a belief in moral order in which they

participate, become committed to continuing involvement in conventional pursuits, and form attachments to conventional persons, e.g., parents and teacher. Those social bonds provide them a stake in conformity that discourages both delinquent behavior and the involvements with peer groups that might support such behavior.

In the next chapter I will use the social bonding models presented here (Appendix K and L), as a theoretical perspective that helps us get further insights into what I saw happening in Mr. Johnson's science classes in terms of the social bonding processes that took place.

CHAPTER VI

OVERVIEW OF THE STUDY, SUMMARY OF THE FINDINGS, RECOMMENDATIONS, AND EDUCATIONAL IMPORTANCE

Overview of the Study

This was a case study of science teaching at the seventh-grade level in an urban middle school. The seventh-grade students in this school are classified and placed into either enriched or general science classes. The students are classified according to their performance on a standardized reading achievement test, teacher recommendations, and/or parental choice.

This case study of an enriched and a general science class taught by the same teacher at this school described the differential treatment of the two classes. In particular it described the consequences enriched and general science placement have on the students and their educators and how the culture created by the students interacts with the placement practices to create unintended consequences. Classroom observations, formal and informal interviews, and surveys, were used to obtain data about the nature of the academic work done by the students, as well as the development of the classroom atmosphere and student attitudes in the two classes.

Summary of the Findings

This study revealed two very different worlds of science instruction for students placed into enriched and general science classes. These differences appeared to be related to perceptions shared by students, teachers, and administrators. The teachers and administrators, as well as the students themselves, perceived the enriched science class to be "special," containing students with similar high academic skills. This perception of the enriched science students being special, coupled with their cooperative behavior and the quality of their class work, led to the teacher and the school giving them more nurturing, autonomy, freedom, and opportunities for participation in interesting and challenging activities than were given to general science students. For their participation in their science class, enriched science students received rewards such as high grades, praise from adults in their environment, and increased opportunities for social interaction with their peers during class time. As the year progressed, the enriched science classroom's atmosphere became even more nurturing and the enriched science students became even more involved in their science class. At the end of the academic school year, the enriched science students possessed more positive attitudes towards their science class, more positive feelings toward their science teacher, and more positive concepts of themselves as science learners.

Furthermore, at least some of the teachers and administrators, as well as many of the students themselves, perceived the general science class to be "average" or "less than average," containing

students with average or less than average academic and social skills which many times led to uncooperative behavior in the classroom.

Even though much of the academic work assigned to the general class was quite similar to the academic work assigned to the enriched science class, these perceptions held. These perceptions, the quality of their class work, and the uncooperative behavior of some of the general science students led to the teacher and the school giving them far less nurturing, autonomy, and freedom, and fewer opportunities for participation in interesting and challenging activities than were given to the enriched science students. For their participation in their science class, many general science students received average or below average grades, little or no praise from adults in their environment, and few opportunities for social interaction with their peers during class time. As the year progressed for the students in the general science, the classroom's atmosphere became more tense and confrontational and the majority of general science students became uninvolved in their science class. At the end of the academic school year, the general science students possessed substantially less positive attitudes towards their science class, substantially less positive feelings towards their science teacher, and substantially less positive concepts of themselves as science learners.

These findings are consistent with the findings of other major studies examining placement policies. Studies done by Oakes (1985) and Goodlad (1983) also found that there are clear differences

between upper and lower placement in regard to the content and quality of instruction, teacher-student and student-student relationships, perceptions held by teachers of their students, and the affective climate of classrooms. However, this study went beyond these findings in important ways.

One additional finding was that the social structure created by the students themselves interacted with the school's placement structure in ways that further alienated the majority of general students. Peer group membership formed a substructure within the general science class which influenced the students' goals, perceptions, and behavior. One group (mostly black students) became increasingly alienated and uninvolved academically over the course of the year. Another group, although academically engaged, became resentful of their placement in the general science class. A third group tended to swing back and forth, depending upon the nature of the work and the social dynamics at the time. This social structure, created by the students themselves, tended to reinforce the separation that the school's placement policy created.

Another finding of this study was the dilemma arising for policy makers and teachers. The perceived dilemma is represented by a trade off between providing a high quality experience in science for a small, select, homogeneous subset of students (i.e. exposure to enriched activities) with the remaining students receiving a marginal (in terms of exposure to enriched activities) experience in science, on the one hand, verses a situation in which all efforts would be made to provide all of the students with an equal exposure

to enriched activities, but risk that all of the students might end up receiving only a marginal experience in science because of the heterogeneity of the students. Policy makers and teachers appeared trapped between these two options, both of which had undesirable consequences.

In the next section, I will use a theoretical perspective that helps us get further insights into what might be done to resolve this perceived dilemma.

Interpretation in Terms of Social Bonding Theory

In this section I will use the social bonding models presented in Chapter V (Appendix K and L). These models provides a language that helps explain what I saw happening in Mr. Johnson's science classes in terms of the social bonding processes that took place.

Let's consider the probable situation on the first few days of class in Mr. Johnson's two science classes. One might speculate that the majority of enriched science students, having been successful in science in the past, came into the class with a history of good relations with science teachers and with positive feelings about their ability to do science class work. In terms of the model we could say that the enriched science students came into Mr. Johnson's science classroom with some prior bonding with science and with science teachers which provided a basis for further bonding.

On the other hand, one might speculate that this was less true for the majority of the general science students. They had probably

not been as successful in science in the past. Furthermore, some of them also came into the class with a history of poor relations with teachers and with some negative feelings about their ability to do science class work. In terms of the model we could say that the general science students came into Mr. Johnson's science classroom with less bonding with science and science teachers and less of a basis for developing further bonding.

I don't want to imply that there was a clear cut distinction between the types of students found in the two classes. On the contrary, it is very likely that one would find some students with either of these characteristics in both classes. The point is that the majority of the students in these classes probably fall into these two categories.

During the first few days of class Mr. Johnson made the following statement to me about his third hour enriched science class: "My third-hour enriched science class is made up of students who are among the best in the school. Now my fourth-hour general science class; they're a different story. Many of them can't read." From that statement and from other observational evidence, I inferred that the enriched science class was perceived by its teacher as containing students who were more capable of learning science and taking responsibility. As a result of this perception, the teacher allowed the enriched students the opportunity to participate more in conventional (hands-on) activities that were engaging, interesting, and meaningful, and that required a certain degree of self discipline because he felt that the majority of

enriched science students had the self discipline, academic capabilities, and the desire to participate in such stringent projects (the leaf collection project is an example of such a conventional activity).

If we add the teacher's perception of the enriched science students to the probable situation the enriched science students were in prior to their entering the classroom, in light of the model (Appendix L), this could be seen as the basis for the development of further social bonding with their science class.

Generally speaking this is what I observed. As the school year progressed, enriched science students appeared to work diligently on conventional activities such as their leaf collection project, showing the teacher that they were willing to cooperate with the stringent demands that he had set. For example, on many occasions I observed the enriched science students bringing leaves that they had found to class to identify. They matched up the characteristics of the leaves with keys in their book. Once they did that, they tried to identify each leaf. The teacher, possibly noticing the enriched science students' enthusiasm and cooperation, put forth the time and energy necessary for the students to acquire the skills needed to complete the project and, from what I could tell, did so with good humor. For example, the teacher brought in special books that helped the students identify more difficult leaves, and he made himself available to the students for guidance.

The students appeared to respond by showing even more enthusiasm, hard work, and commitment to the task. Finally, the

students acquired all the necessary skills to complete their projects.

They learned how to recognize certain families of leaves, and how to mount and label the leaves in their books; They also learned the scientific terminology used by horticulturists when naming leaves. The rewards they received were high grades from their teacher and praise from those in their environment.

As can be seen, the students in the enriched science class were provided with an opportunity for participation in a conventional (socially approved) activity, e.g., the leaf collection project. During the course of this activity, the enriched students acquired skills (how to mount, observe, analyze, classify, and categorize leaves) necessary to take advantage of the opportunity provided. As a reward for their participation in this conventional activity, the enriched science students received good grades and praise for their accomplishment.

In the social bonding model presented in chapter 5, these elements (opportunities, skills, rewards) all contribute to forming a tendency to become involved in conventional pursuits, in this case their science class. From those involvements, the enriched science students became more committed to continuing involvement in conventional pursuits, e.g., doing other work in their science class and, thus, they formed attachments (social bonds) to conventional persons, in this case their science teacher and other cooperating students. One might also speculate that the enriched science students formed a belief in the moral order in which they

participated, e.g., the belief that the science teacher or school was just. These strong conventional bonds provided the enriched science students with a basis for further social bonding that discouraged both disruptive behavior and involvements with peer groups that might support disruptive behavior.

I will now use the same model to help explain what happened in Mr. Johnson's general science class. I speculated earlier that the majority of general science students came into Mr. Johnson's science class having had less bonding with science and science teachers and less of a basis for developing further bonding than did the enriched science students. From statements made by Mr. Johnson such as I referred to earlier, and from other observational evidence, I inferred that the general science class was perceived by the teacher as containing many students who were at times uncooperative, disruptive, and irresponsible, with limited ability and/or motivation to learn science. As a result of this perception, the teacher did not allow the general science students the opportunity to participate in many conventional (hands-on) activities that were engaging, more interesting, and meaningful, and that required a certain degree of self discipline, because he did not feel that the majority of general science students had the self discipline, academic capabilities, or the desire to participate in such stringent projects like the leaf collection project. If we add the teacher's perceptions of the class to the probable situation the majority of general science students were in prior to their entering the classroom, in light of the model (Appendix L), this could be

seen a limiting basis for the development of further social bonding with their science class.

In terms of the social bonding model, the elements needed for social bonding appeared lacking in this classroom. As compared to the enriched science class, the general science class presented a different pattern for opportunity, skills, and rewards.

Generally speaking, the general science class experienced fewer opportunities to participate in engaging, more interesting and meaningful activities; less support for gaining skills; and fewer rewards for gaining skills.

In the social bonding model presented in chapter 5, when these elements (opportunities, skills, and rewards) are not sufficiently provided, students do not become involved in conventional pursuits, in this case, their science class. From the lack of sufficient involvement in conventional pursuits, many of the general science students did not become committed to involvement in other conventional pursuits, e.g., doing other work in their science class and, thus, formed weak attachments (social bonds) to conventional persons, in this case their science teacher. One might also speculate that many of the general science students did not form a belief in the moral order in which they participated, e.g., they did not believe that the science teacher or school was just. These weak conventional bonds freed some of the general science students (the swing group) to associate with other disruptive students in the general science class (entering alienated students that usually

instigated disruptive behavior); thus, it supported more disruptive behavior.

In addition, the teacher's perceptions and the behavior of certain members of the general science class led the teacher to use certain tactics that further limited the opportunity to promote bonding with many of the students and increased the opportunity for certain students to association with disruptive students and to participate in disruptive behavior.

For example, he gave the general science students tasks that were not very engaging (such as copying sentences out of their science books); he physically moved disruptive members of the class to the back of the room where they had more opportunities to interact with other disruptive students (thus helping to create a larger group of students who were alienated from the class); and he assigned many students in this class poor citizenship grades that prevented them from becoming eligible to go to special school events that might have allowed the students the opportunity to see teachers in a different light (events such as the science camp).

I have tried to show how the social bonding model helps us understand and interpret what happened in Mr. Johnson's science classes in terms of the bonding processes that took place. In short, as I observed the enriched science class, the development of social bonding between the enriched science students and the teacher throughout the school year appeared to grow stronger. As I observed the general science class throughout the school year, the social bonding between the general science students and the teacher

appeared to grow weaker. Furthermore, a significant number of general science students appeared to bond more with the small number of general science students who entered the class already alienated toward science. This is consistent with what we saw in the social bonding model and alerts us to the effect that the small number of entering alienated students has on the tone of the general science class.

Applying the model (Appendix K) to this situation, the weak conventional bonding between general science students and their science class freed some students (swing group) for participation and subsequent bonding to disruptive peers (entering alienated students) that supported disruptive behavior.

Perhaps a pictorial representation would be useful here (see Appendix M, N, and O).

In the first diagram the enriched science class is depicted as a homogeneous group of academically motivated students that shared the same goals, perceptions, and behavior patterns. The general science class is depicted as a heterogeneous group of students, some of whom were academically motivated, some of whom were not, and some of whom came into the class already alienated towards science class. The second diagram shows what happened to the two science classes as the school year progressed. In the enriched science class things appeared to stay the same; however in the general science class, the social structure created by the students themselves appeared to form three subcultures within the science class, each with different goals, perceptions, and behavior patterns. One group, the

academically motivated group, was academically motivated towards their science class. Another group, the alienated group, started out alienated and uninvolved academically towards their science class and continued that pattern throughout the year. A third group, the swing group, tended to swing back and forth, (from being academically motivated to being uninvolved academically) depending upon the nature of the work and the social dynamics at the time. The teacher and the students in the academically motivated group appeared to compete with the students in the alienated group for the allegiance of the students in the swing group. The result of this competition was that the alienated group grew larger as members of the swing group joined them.

If we were to assume that the situation that I have portrayed here in Mr. Johnson's two science classrooms (enriched and general) is representative of all the science classrooms at Loran, then the impact of this phenomena of increasing alienation across eleven out of thirteen science classes represents a serious problem for a large majority of science students at Loran.

The third diagram shows the projected picture at Loran, where there are two enriched science classes and eleven general science classes. In the enriched science classes, teachers feel that they can allow the enriched students the opportunity to participate more in conventional (hands-on) activities that are engaging, interesting, meaningful, and that require a certain degree of self discipline. However, the formation of subcultures within the general science classes creates situations which makes it difficult

for teachers to provide such opportunities for general science students. Here again I draw attention to the effect that the small number of entering alienated students has on the tone of the general science class. There is no doubt that this small number of entering alienated students is making quality science teaching difficult for the teachers at Loran. It also appears that the school's practice of ability grouping science students is interacting with the formation of subcultures within general science classes in ways that enhances this phenomena and contributes to the creation of more and more alienated science students.

The findings of this study seem to corroborate the policy conclusion that ability grouping should end in all U.S. science classrooms. However, to draw such a conclusion from these findings would be a mistake. The data presented in this study are not statistically generalizable; evidence from two science classrooms cannot be extrapolated to other settings as proof that ability grouping is bad in general. Even to add the findings together with other interpretive studies in a sort of meta-analysis is methodologically unsound.

However, if we were to assume that the situation that I have portrayed here in Mr. Johnson's two science classrooms (enriched and general) is representative of many science classrooms in many school districts where ability grouping is being practiced, then the results of this study would have important implications. It is up to the reader to judge the extent of similarity between their particular context and that of this study.

In those cases where there are similarities with the findings of this study, what recommendations do I have for policy makers struggling with this problem? In the next section I will present some recommendations that I feel are relevant to the findings of this study. The applicability of these recommendations is something that the reader will also have to judge. These recommendations however, should not be viewed as suggestions only to teachers, nor should they be viewed as suggestions only to school districts. These recommendations should be viewed as additional alternative for policy makers (State Governors and State Legislatures) to consider when making decisions about the allocation of resources to educational programs.

Recommendations

The dilemma as perceived by the teachers and the district policy makers at Loran suggest two alternatives. On the one hand the placement policy can be kept, resulting in a quality experience in science for a small, homogeneous group of science students (the enriched science students), while teachers do the best they can with the majority of science students (the general science students), risking the possibility that the general science students won't have a quality experience in science because the heterogeneous make up of the students in general science classes (especially the two or three entering alienated science students) might make it difficult for teachers to accomplish their goals. On the other hand, the placement policy can be abandoned, causing teachers to do the best

they can with the heterogeneous group of all the science students, risking the possibility that no science students will have a quality experience in science because the heterogeneous make up of all the science students (especially the small number of entering alienated science students) might make it difficult for teachers to accomplish their goals.

From the discussion presented in chapter four, it appeared that policy makers and teachers felt trapped between these two options, both of which had undesirable consequences. But were there other options that they were not considering? Sometimes, the only way out of a dilemma is to consider new possibilities. One of the ways in which new possibilities might be considered for this setting would be to look at a theoretical perspective that might help us get further insights into what going on in the setting. In the previous section I describe such a framework. From it I concluded that both sides of the dilemma that district policy makers had to chose from seem to be made critical by the impact made by the entering alienated students. Therefore my recommendations are:

(1) Identify all entering alienated science students and create an intensive intervention program for them.

(2) Make the science classes heterogeneous (i.e. don't ability group the students), but provide "enrichment" activities for all the science classes.

(3) Use cooperative learning strategies in all science classrooms.

(4) Support teachers in developing and implementing strategies for improving interpersonal relationships with all students.

(1) Identify all entering alienated science students and create an intensive intervention program for them.

From the evidence presented in this study it appears that quality science teaching was made difficult because most classroom science teachers could not accommodate all the needs of the growing number of entering alienated science students within the framework of their classrooms. Thus, I argue that it is important to have an intensive intervention program that addresses this group of students.

The second argument that I make for having an intensive intervention program for entering alienated students follows an argument of justice in Rawls's (1971) sense. Rawls argues that most of the inequalities in life are the result of the "natural lottery." For example, you might inherit from your ancestors a set of genes that give you a greater skill, or you might be born to a family that has a more positive attitude of what is good for you, or teaches you good work ethics. Rawls argues that this is not something that you earn; you don't necessarily deserve it--it's simply the luck if the draw. Rawls argues that a system that is just should compensate for the inequalities of the "natural lottery." Therefore, if schools are going to create special programs for students, the programs should be geared toward the students who drew the short straws. In this case it would be the students that come to class already alienated. This might help foster in these students a belief in the moral order of the system.

(2) Keep the science classes heterogeneous but provide "enrichment" activities for all the classes.

The idea here is to increase and expand on the number of conventional (hands-on) activities that are engaging, interesting, and meaningful to all the science classes so that all the students have the opportunity to participate in them. This recommendation goes along with the theory supporting the use of strategies for promoting social bonding in the classroom. As you recall from the discussion of the model presented in chapter 5, when teachers provide students with opportunities to become engaged in activities that are interesting and relevant to the student; present a manageable degree of challenge; contain some moderate risk (possibility of error or failure); provide some freedom of movement and choice; and supply some knowledge of the results of the activity. And when students are able to attain the skills needed to take advantage of those opportunities, and receive rewards for their participation, they tend to become involved in conventional pursuits, e.g., school activities. From those involvements, they form a belief in moral order in which they participate, become committed to continuing involvement in conventional pursuits, and form attachments to conventional persons, e.g., parents and teachers. The development of these strong conventional bonds provided the enriched science students with a basis for further social bonding that discouraged both disruptive behavior and

involvements with peer groups that might support disruptive behavior.

(3) Use cooperative learning strategies in all science classrooms.

An extremely successful way of conducting instruction with heterogeneous groups involves the use of cooperative learning. Cooperative learning uses small heterogeneous groups of students as learning partners. Students of differing abilities and backgrounds work together in teams to master curriculum material and receive recognition as a team for their group's academic performance. Research has shown that cooperative learning methods are more effective than traditional ones in increasing student achievement and in developing mutual concern among students across racial groups (Slavin, 1982).

Training in basic cooperative skills reinforces students in helping each other to succeed in classroom endeavors, thus reducing alienation in the classroom and promoting attachments among students to accepted academic pursuits. This in turn, reduces the likelihood that students will form alternative attachments with disruptive peers which might lead to disruptive behaviors (Hawkins and Weis, 1981).

Cooperative learning may help to prevent disruptive behavior in two additional ways. Since school achievement is related to students' perceptions of their own competence and to their

commitment to school (Johnson & Johnson, 1980), and both are associated with rates of delinquent (disruptive) behavior (Hawkins and Weis, 1981), it appears that cooperative learning may promote positive school experiences and prevent disruptive behavior by, helping some students to perceive themselves as academically more competent, and thus on an equal status with other students, and by motivating students who have not been achievers to work and contribute to their teams to the best of their abilities even though they may continue to view themselves as lesser in ability than other students.

(4) Support teachers in developing and implementing strategies for improving interpersonal relationships with all students:

It occurred to me that if I wanted to create a social bond with the students in the a class (thus preventing the alienation of a group of students) I might do some additional things. These things I feel might help to create inter-personal relationships with certain members of the class. For example, I might be sure to greet the students at the door everyday and welcome them to the class, providing a sense that I was happy they were able to be in my class today. I might encourage the participation of all students, especially students that I felt were at-risk, in the lessons, discussions, and activities. Students whom I found were not participating as actively as I felt they should or were not

understanding the subject matter, would be continuously asked to participate in conversations with me (either in a small group or individually) about problems they were having with me or with the subject matter, or just to talk about things that were important to them. If parents of these students did not come to parent-teacher conferences, I might plan visits to their homes to help develop communication between their parents and myself. In addition, rationale for any strategies that I was using to get students to accomplish something I wanted might be continuously explained until I was sure the strategies and it's purposes were clear to the students.

I would like to introduce an intensive intervention program that incorporates all of the feature I have recommended for policy makers to consider when designing a program for heterogeneous groups of students. This program aimed at entering alienated 9th grade students is presently being used by a inner city high school in Charleston, South Carolina. The school is Burke High School. The intensive intervention program undertaken in collaboration with The Citadel, a state-supported undergraduate military college with an extensive graduate program in education, demonstrates an alternative strategy for addressing the problem of depressed academic performance in an inner city high school.

This intensive intervention program, entitled Project Challenge (Mahan & Mahan and Gaillard, 1987) and now receiving some partial support from the Jessie Ball DuPont Fund, is aimed at showing that a rigorous academic program could be an effective medium for enhancing

achievement at the high school level provided the proper support mechanisms were included. The list which follows provides a skeleton format of the issues that need to be addressed in the design of such a intensive intervention program:

- the classroom must reflect a purpose which is clear and consistently reinforced by actual behaviors;
- the problem of alienation must be viewed as a result of lack of identification with schooling;
- the curriculum must engage students and must be designed to counterbalance (rather than intensify) the developmental fragmentation of early adolescence;
- the program must include the elements of social capital such as attention, caring, enduring adult relationship with these students;
- deficits in skills and negative aspects of self-conception must be addressed with direct interventions which are supportive and encouraging in nature;
- the program must have a strong connection to the parents and communities of these students and to involve communities;
- the persistent theme must be the students' to discovery of their abilities and talents along with the growing awareness of their "control" of their academic fates;
- learning and the curriculum cannot be separated from the personal lives and needs of the students -- indeed, these elements must be intertwined;
- the program must be built upon a team-design with participation, sharing and joint ownership as a overriding component;
- differences between students should be acknowledged, however, instead of interpreting them as problems that require remediation, they should be viewed as enrichments that enriches the lives of all classroom participants;

- the program should reflect the uniqueness made possible by intense college-school collaboration.

Educational Importance

The educational importance of this study is that it illustrates how the national pattern in which we find only a small percentage of science students prepared to participate in the new technology is developing in one middle school. More specifically, it illuminates how school curriculum and placement policies can interact with students' social groups and norms in contributing to this trend.

This study makes a contribution to educational research because it uses interpretive qualitative methods to study a problem that is typically studied in quantitative methods. It provides for a better sense of insiders' points of view and their perceptions of their experiences in science class. Of particular importance is the procedure in which the target teacher is given the opportunity to make a substantial contribution to the analyses and actual written results (see Appendix A). This led to a much fuller and empathic view of the teacher than would have been likely otherwise.

This study makes a contribution to practice in that it provided the target teacher with a picture of his practice and its effect on his students that he might not have otherwise had. An increasing awareness of the students' perspectives might help him begin to see new possibilities for the dilemma he had faced. This might help the target teacher and others reading this study who are in similar circumstances to reflect on their practice in positive ways.

Even more important to this are the policy implications that might arise from this study. Curriculum developers and policy makers might become better informed about the impact that organizing science classes into ability groups might cause. It might encourage them, having seen the differential impacts, to rearrange science educational opportunities to include a wider range of the students population. Further, it suggests that attention be given to social structures within the school and community and that efforts be made to draw at risk-groups and individuals into academic participation.

I want to acknowledge that what I saw in the general science class at Loran is not something I saw just because this school tracks its science students. I suspect that the same social differentiation of students within science classes would occur even if the enriched science students were dispersed throughout, and there were no such thing as enriched and general science classes. The only difference one might find is that the social groups that develop might be larger. My point is that the development of social groups within science classrooms is a common problem. I speculate that in our educational system, 90% of the time, what I saw in the general science class is the way it is. Through this study I feel that I have captured the dynamic of this problem and a theoretical perspective for thinking about it. This problem is only made worse by the schools' practice of ability grouping.

APPENDICES

APPENDIX A

SEATING CHART
LORAN SCHOOL DISTRICT (9/5/89)

Seating Chart . . . Loran School District (9/5/89)

* target students

Period: 3 Subject: Enriched Science Room: 151 Teacher: Mr. Johnson

Rear

	Lab Table 6		Lab Table 5		Lab Table 4	Door
	Lab Table 1		Lab Table 2		Lab Table 3	
WINDOWS						HALL
	Lisa	Jim	Eva	Randi	Sharon	Erin*
	Nicole	Tish	Marty*	Rita	Ray	Ned
	Angel	Leslie	Walt	Paul	Kit	David
	Theresa*	Concetta*	Felice	Cemmen	Carly	Carrie
	Devin	Norman	Debra	Egar	Ben	Shelly
						Door

Mr. Johnson's Desk Front

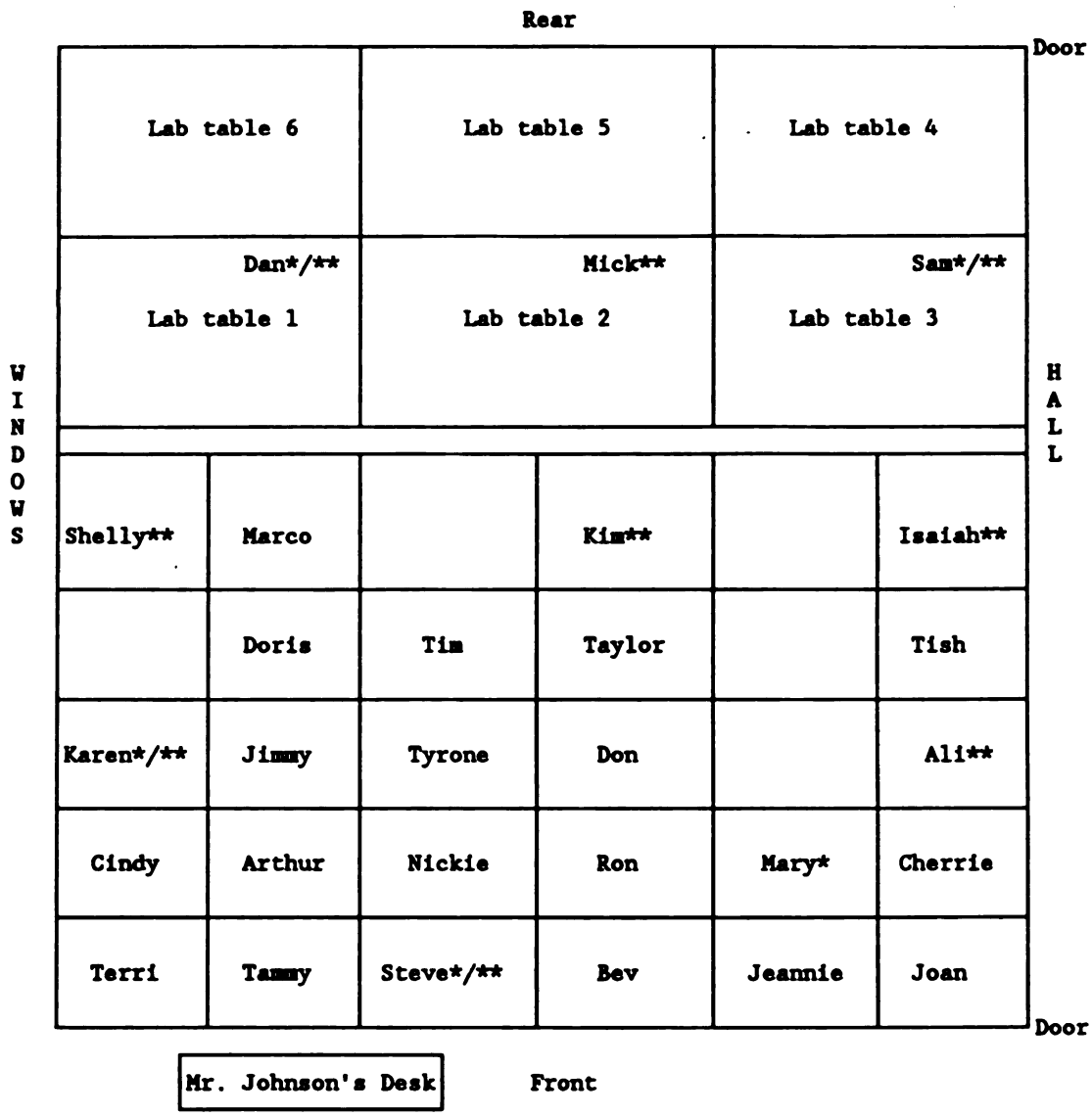
APPENDIX B

SEATING CHART
LORAN SCHOOL DISTRICT (9/5/89)

Seating Chart . . . Loran School District (1/18/90)

* target students
** students who participate in gum chewing escapade

Period: 4 Subject: General Science Room: 151 Teacher: Mr. Johnson



APPENDIX E

SEATING CHART
LORAN MIDDLE SCHOOL (5/90)

Seating Chart . . . Loran Middle School (5/90)

* target students

Period: 3 Subject: Enriched Science Room: 151 Teacher: Mr. Johnson

Rear

	Lab Table 6		Lab Table 5		Lab Table 4	Door
	Lab Table 1		Lab Table 2 Marty*		Lab Table 3	
WINDOWS	Lisa	Jim	Eva	Randi		Erin HALL
	Nicole	Tish		Rita	Ray	Ned
	Angel	Leslie	Walt	Paul	Kit	David
	Theresa*	Concetta*	Felice	Cemmen	Carly	Carrie
	Devin	Norman	Debra	Egar	Ben	Shelly Door

Mr. Johnson's Desk Front

APPENDIX D

SEATING CHART
LORAN SCHOOL DISTRICT (1/18/90)

APPENDIX F

SEATING CHART
LORAN MIDDLE SCHOOL (5/90)

Seating Chart . . . Loran Middle School (5/90)

* target students
** students who supported Dan in candy dispute

Period: 4 Subject: General Science Room: 151 Teacher: Mr. Johnson

Rear

Karen*/** Lab Table 6		Lab Table 5		Cindy** Lab Table 4	
Dan* Lab Table 1		Lab Table 2 Mick*/**		Lab Table 3 Sam**	
Shelly	Marco		Kim**		Isaiah**
	Doris	Tim	Taylor		Tish
Jane	Jimy	Tyrone	Don		Ali
	Arthur	Nickie	Ron**	Mary*	Cherrie**
Terri	Tammy	Steve*/**	Bev	Jeannie	Joan

WINDOWS — HALL — Door (front) — Door (rear)

Mr. Johnson's Desk — Front

APPENDIX G

DAY BY DAY LIST OF ACADEMIC WORK DONE BY STUDENTS PER CHAPTER

Day by Day List of Academic Work Done by Students Per Chapter

	Preview Chapter Using the Scientific Method & A Overview of Living Things	Chapter 1 Plants	Chapter 2 Invertebrate animals	Chapter 3 Vertebrate animals	Chapter 4 Protists	Chapter 5 Ecosystems	Chapter 6 Interactions Among Living Things	Chapter 7 Cells	Chapter 8 Seed Plants	Chapter 10 Matter the Basic Ingredient	Chapter 11 Total Synthesis/ Restoration & Decay	Chapter 12 Transfer of Matter & Energy
Day 1	Discuss P.1 using lab equip. properly & demo on making observation	Lab on how lab equip. ordered	Lab on taking measurement mass/tri. beam	Read outloud Ch. on vertibrate an.	Read Chap. outloud	Read around the room.	Read around the room.	Read around the room.	Read around the room/* T.O.P.S.	Read around the room.	Read around the room.	Read around the room.
Day 2	Outline the Chapter P.2	Finish lab on how to order lab equipment	Continue lab on taking measurement mass/triple beam	Definition of Vocab. words.	Outline the Chapter	Outline	Outline	Outline	Outline/* T.O.P.S.	Outline	Crossword	Worksheet
Day 3	Lab on making observation P.3	Read Ch. outloud	Continue lab /*worked on leaf proj.	Lab on classifying vertebrate animal	Continued outline of Chapter.	Outline	Outline	Crossword	Outline/* T.O.P.S.	Picture questions	Worksheet using Coop. Lrng.	Crossword
Day 4	Continue lab from previous day/ *introduce leaf coll. proj. P.4	Continue read Ch. outloud/ *worked on leaf coll. project	Continue lab /*finished leaf coll. project	Continue w/ lab on vertebrate classifying	Worksheet/ * groups- Coop. Lrng.	Lab on cell study	Lab-Study characteristics of populations	Worksheet	Outline/* T.O.P.S.	Lab using periodic table	Worksheet	Quiz
Day 5	Continue lab & tchr. did demo on making observe. P.5	Started lab on taking measurements using metric system 1.6	Continue lab /measure. of mass.	Finished lab & discussed lab	Answer questions relating to pictures in Chapter	Lab continue	Lab continue	Wordsearch	Worksheet/* T.O.P.S.	Continue lab	Quiz	Wordsearch

Day by Day List of Academic Work Done by Students Per Chapter

	Preview Chapter Using the Scientific Method & A Overview of Living Things	Chapter 1 Plants	Chapter 2 Invertebrate animals	Chapter 3 Vertebrate animals	Chapter 4 Protists	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 10	Chapter 11	Chapter 12	Chapter
Day 6	Finish lab P.6	Continue lab 1.6	Read Chap. outloud	Crossword puzzle on the Chap.	Lab on using microscope	Lab continue	Start lab communities biome	Test	Crossword/* T.O.P.S.	Section check/* morris code	Test on Chp. 11&12		
Day 7	Read Chap. outloud	Continue lab	Worksheet in groups - Coop. Lrng	Outline Chapter	Continue lab	Lab Continue	Test		Wordsearch /*T.O.P.S.	Worksheet			
Day 8	Cont. Rdg. Outloud	Did worksheet on Chapter/* worked on leaf coll. project	Did Chap. checkup/ *vocab. builder	Cont. outline Chap.	Finish lab on using microscope	Lab on shape & function of cells	Lab on predator & prey relationships		Practice test/* T.O.P.S.	Crossword			
Day 9	Write topic sentence for each paragraph in chap.	Worksheet on Chap.	Worksheet on Chap.	Answer questions relating to pictures in chapter & lecture	Chapter checkup	Lab continue	Lab continue		Test/* T.O.P.S.	Review for test			
Day 10	Chapter checkup	Outline the chapter	Lab on measuring vol. & how sci. set up experiments	Answer questions relating to pictures in chapter & lecture	Crossword puzzle on the Chap.	Lab continue	Lab continue			Test			

Day by Day List of Academic Work Done by Students Per Chapter

	Preview Chapter Using the Scientific Method & A Overview of Living Things	1 Plants	Chapter 2 Invertebrate animals	Chapter 3 Vertebrate animals	Chapter 4 Protists	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 10	Chapter 11	Chapter 12
Day 11	Answer questions relating to pictures in chapter/* test on ch.	Word search on chapter	Continue lab	Lecture & worksheet	Practice test	Worksheet & Crossword	Lab continue					
Day 12	Test on ch. /*worked on leaf coll. project	Crossword puzzle on chapter & lecture	Finish lab	Game related to chapter	Test on ch.	Lab on cell structure						
Day 13		Write topic sentence for each paragraph in ch. /*test on ch	Outline ch.	Answer questions relating to pictures in chapter		Continue lab						
Day 14		Test on ch. /*work on leaf coll. project	Answer questions relating to pictures in ch./*how to use codes	Movie on vertebrates		Continue lab						
Day 15			Lab on mak-data table	Word search		Worksheet & review chp.						

Day by Day List of Academic Work Done by Students Per Chapter

	Preview Chapter Using the Scientific Method & A Overview of Living Things	Chapter 1 Plants	Chapter 2 Invertebrate animals	Chapter 3 Vertebrate animals	Chapter 4 Protists	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 11	Chapter 12
Day 16			Answer questions relating to pictures in chapter	Practice test		Video on earth biomes & organisms found there.					
Day 17			Word Search	Test on Ch.		Crossword					
Day 18			Lab-Build paper grasshopper			Quiz					
Day 19			Continue lab			Wordsearch					
Day 20			Continue lab & finish lab			Picture questions/* Science camp					
Day 21			Crossword puzzle on chapter			Worksheet/* Science camp					
Day 22			Prac. test			Sci. World Mag./*Camp					
Day 23			Test on Ch.			R.I.P./* camp					

Day by Day List of Academic Work Done by Students Per Chapter

	Preview Chapter Using the Scientific Method & A Overview of Living Things	Chapter 1 Plants	Chapter 2 Invertebrate animals	Chapter 3 Vertebrate animals	Chapter 4 Protists	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 11	Chapter 12
Day 24						Write the sentice of para. of ch.					
Day 25						Pract. Test					
Day 26						Test					
Related Chapter Act.		Movie on plants									
Unrelated Chap. Act.	Read Sci. World Mag.	Did library proj.				Five days of drug ed. classes & Sci. World magazine	Five days of sex ed. class		9 days of/* T.O.P.S.	Morris code	

*The enriched students did this exercise.

APPENDIX H

TABLE OF QUESTIONS REFLECTING STUDENTS' ATTITUDE TOWARD THEIR SCIENCE CLASS

Tables of questions reflecting the students attitude towards their science class.

	n	Q_1			Q_2			Q_3		
		Pos	N	Neg	Pos	N	Neg	Pos	N	Neg
General	21	57%	24%	19%	24%	38%	38%	33%	19%	48%
Enriched	28	79%	7%	14%	57%	43%	0%	86%	14%	0%

APPENDIX I

TABLE OF QUESTIONS REFLECTING STUDENTS' CONCEPT OF THEMSELVES AS A SCIENCE LEARNER

Tables of questions reflecting the students concept of themselves as a science learner.

	n	Q_1			Q_2			Q_3		
		Pos	N	Neg	Pos	N	Neg	Pos	N	Neg
General	26	58%	11%	31%	58%	11%	31%	31%	54%	15%
Enriched	29	90%	10%	0%	100%	0%	0%	72%	28%	0%

APPENDIX J

QUESTIONNAIRE REFLECTING STUDENTS' RELATIONSHIP WITH TEACHER

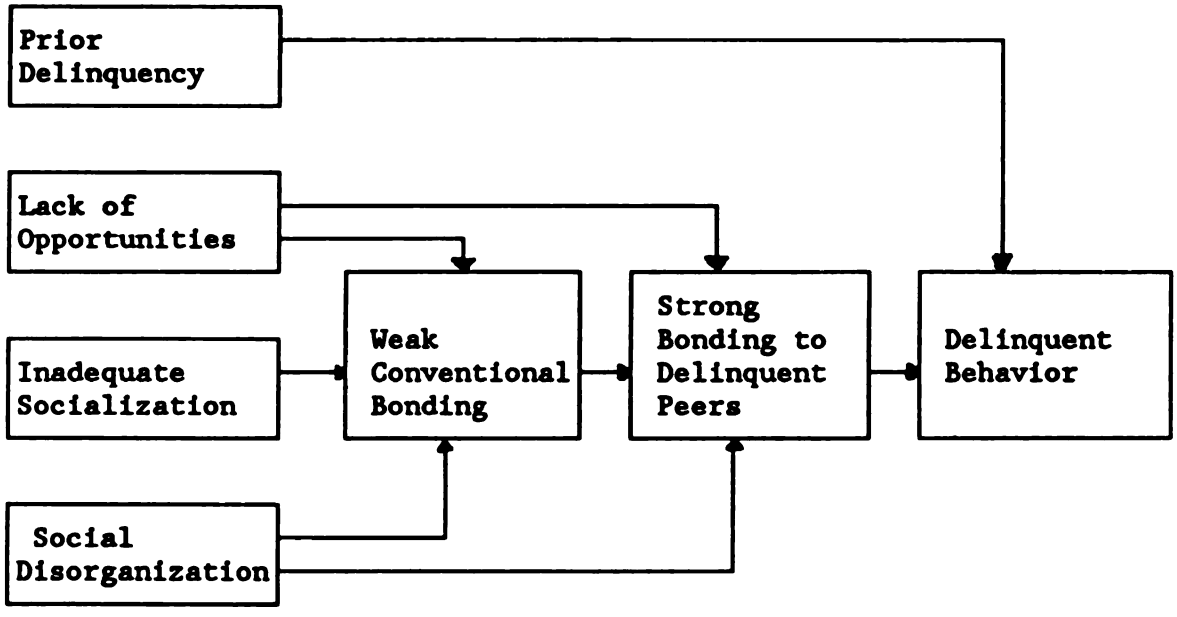
Questionnaire reflecting the students relationship with the teacher.

	n	Q_1			Q_2			Q_3		
		Pos	N	Neg	Pos	N	Neg	Pos	N	Neg
General	20	25%	20%	55%	30%	15%	55%	25%	25%	50%
Enriched	29	79%	7%	14%	76%	7%	17%	86%	7%	7%

APPENDIX K

ELLIOTT, HUIZINGA, AND AGETON'S SYNTHESIS OF DELINQUENCY THEORIES

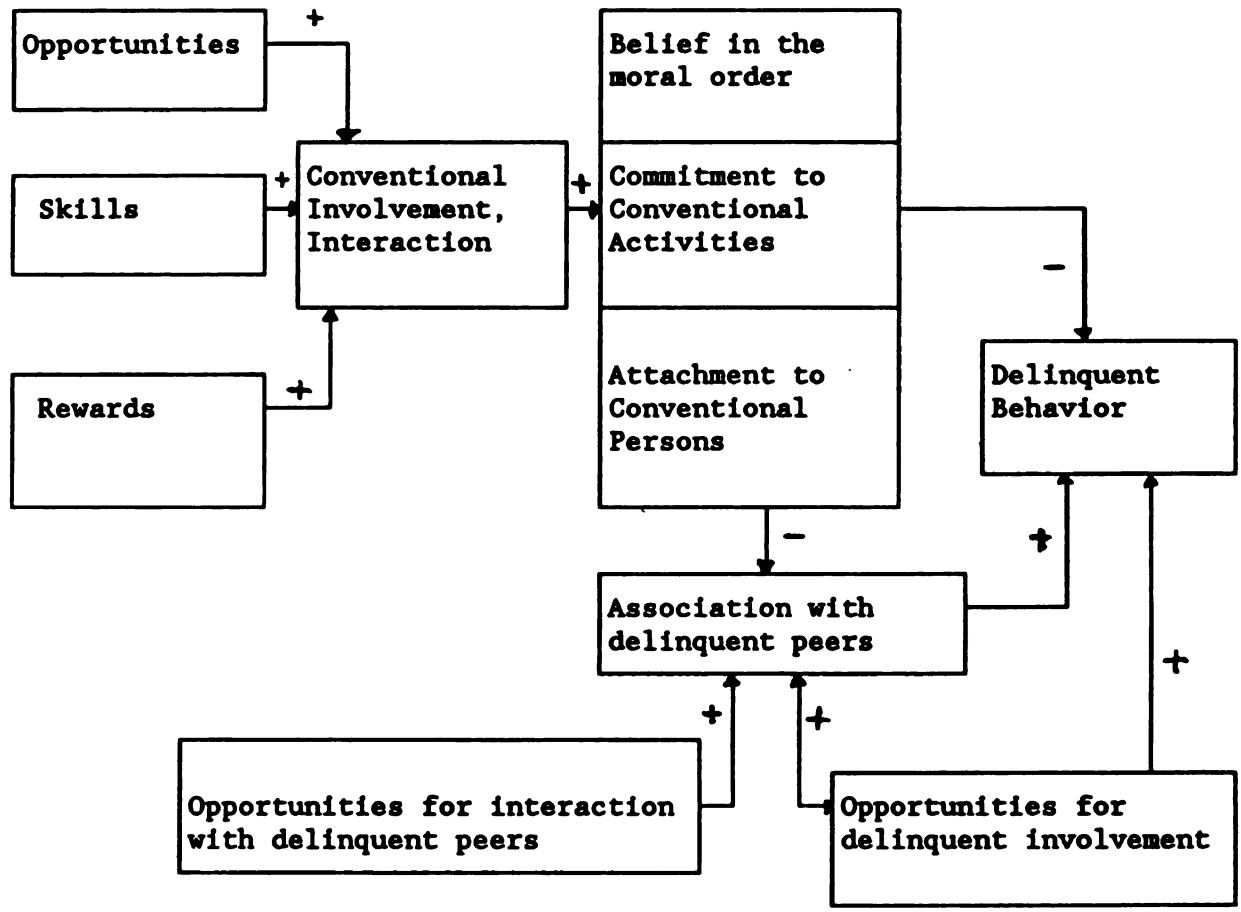
Elliott, Huizinga, and Ageton's Synthesis of Delinquency Theories



APPENDIX L

WEIS' AND HAWKINS' SYNTHESIS OF THEORIES OF DELINQUENCY

Weis's and Hawkins's Synthesis of Theories of Delinquency



APPENDIX M

DIAGRAM OF TARGETED ENRICHED AND GENERAL SCIENCE CLASSES AT THE BEGINNING OF THE SCHOOL YEAR

Diagram of Targeted Enriched and General Science Class at the Beginning of the School Year

Enriched Science Class **General Science Class**

APPENDIX O

TARGET TEACHER'S REMARKS

TARGET TEACHER'S REMARKS

I'd like to say at the onset that I've known Keith for at least four years. He was doing research on classroom interactions and wanted to observe several of my classes. I mentioned to him that almost all researchers do the research and then we at the classroom never hear from them again. He kept his word and is therefore free to come into my classroom anytime he wants.

Keith wrote about the leaf collection and you, gentle reader, may wonder why I don't have the general science classes do leaf collections. This is why: When I started teaching, the students here at Loran would do leaf collections and for the most part do them well. However, about six or eight years ago the students in general classes simply did not do the work required in a leaf collection. After two years with only half of the students in general classes turning in the collections, I quit giving this assignment to them. The enriched classes, however, still do a leaf collection for me and usually do a very good job.

Once in awhile, a student or a parent will want to know if the leaf collection is available for general students. I always tell them they can do it if they want to and I'll give them full credit. I have had only two students in general science ever do the leaf collection project. Perhaps the work is too hard or uses too much of their time.

I'd like to say a few words about the camping experience at Loran. For most of the youngsters, this is a highlight of their academic year. They get more science in the week at camp than they do in six weeks at school. Also this is a place where you can do field activities in the out of doors. If you want to identify trees, birds or insects, you take your group of youngsters out on one of the trails and do it. The camp is blessed with a mature beech maple forest, a fen, a prairie that has never been plowed, a large swampy area, and a small lake (about 12 acres). Over the years we have been taking students down to the camp, we have made many studies of these areas. We here at Loran think we have a good program for camp.

We also have taken the students on various trips to nearby areas to do half day canoe trips and swim in the Great Lakes. In addition, we have done bird banding at a nearby bird area. The core of teachers that go down to camp are the ones that will take students on other trips to places like Cedar Point and Boblo Island. We used to take the ninth grade students on weekend canoe camping trips on rivers in the upper part of the state. When we changed from a junior high school to a middle school, the ninth graders left. The eighth graders were not physically or emotionally ready to go on weekend trips. The camp has once again allowed us to take our students outdoors to learn and have fun.

One of the problems with the camping program is the cost involved. It started out at about $35.00 for the week and is now at $55.00 a week. Also, the district picks up some additional money as other school districts pay about $95.00 for the

week per student. In general classes, we have more students that are eligible to go but don't go to camp. One of the reasons may be the cost. If some money was made available to students in the form of grants or scholarships more of them would go, I'm sure.

We also have a policy that students with poor citizenship can't go on any kind of field trip. This is a good policy as students with poor citizenship will destroy your camping program and you will have many discipline problems very quickly. The teachers that go down to camp are pretty much agreed that if we were forced to take students with poor citizenship, we probably would not go.

One of the best things that happens at camp is that students and teachers see each other in a different light. At school we have to dress properly for class, usually in a coat and tie, but at camp we dress in jeans and are very casual.

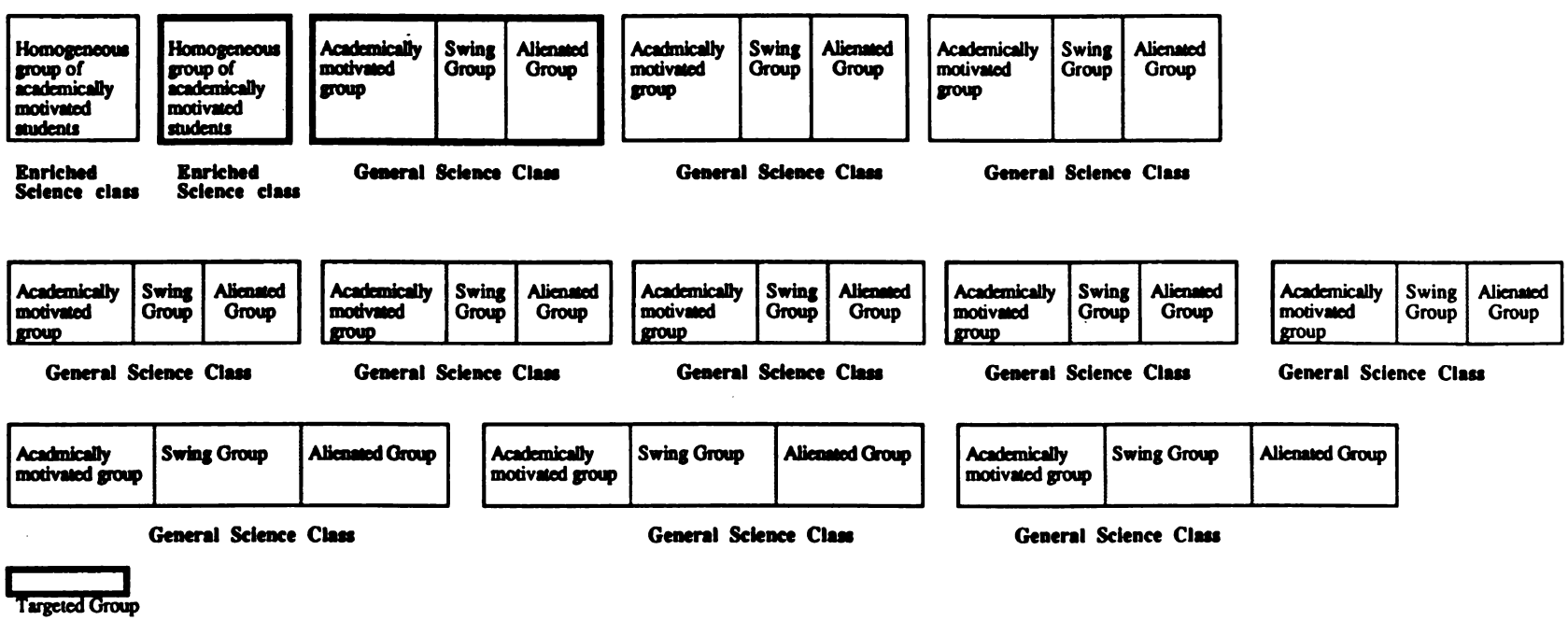
The camp offers a wide range of opportunities for students to observe, classify, interpret, analyze and think about science in general. I have met quite a few students after they graduated from high school and to a person they said the number one best thing about science was the science camp or, going farther back, the weekend canoe camping trips. They also mention to me that it was good to get away from the students that caused them problems at school. Youngsters that go to camp do not have to have good grades but they usually are above average. These students are picked upon as "nerds, pets, etc." when at school. I have seen problem students destroy the work of hard working students and hit them in the hall and throw things at them. That is unfortunate but it happens daily in Loran in the classrooms and in the halls. I have also seen the grades of average students go up after the camp experience. They seem to have more interest in science after they come back. I have had parents tell me their youngster now puts in more time on homework after camp.

This particular way of doing research seems to me to be a very good way. I like how Keith kept coming back to me to check on this or that about the research. He really wanted to get the facts straight before he went further. I was very surprised when he asked me to say a few words to add to his thesis as an appendix. Again, because he has kept his word to me and to the school and the school district, he is welcome to come back into my classroom any time he wants.

APPENDIX P

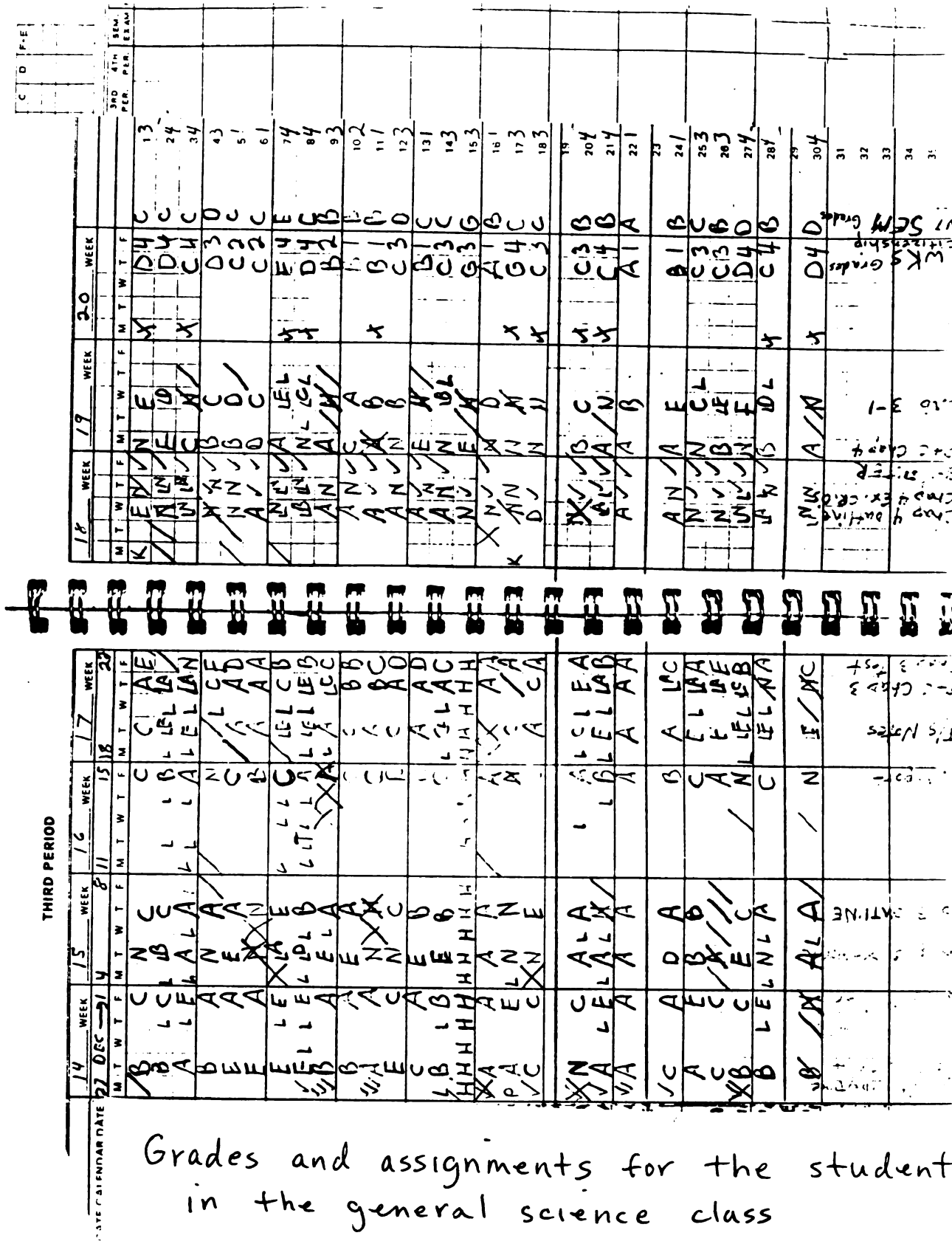
PROJECTED PICTURE OF ALL SCIENCE CLASSES AT LORAN AT THE END OF THE YEAR

Projected Picture of all Science Classes at Loran at the End of the Year



APPENDIX Q

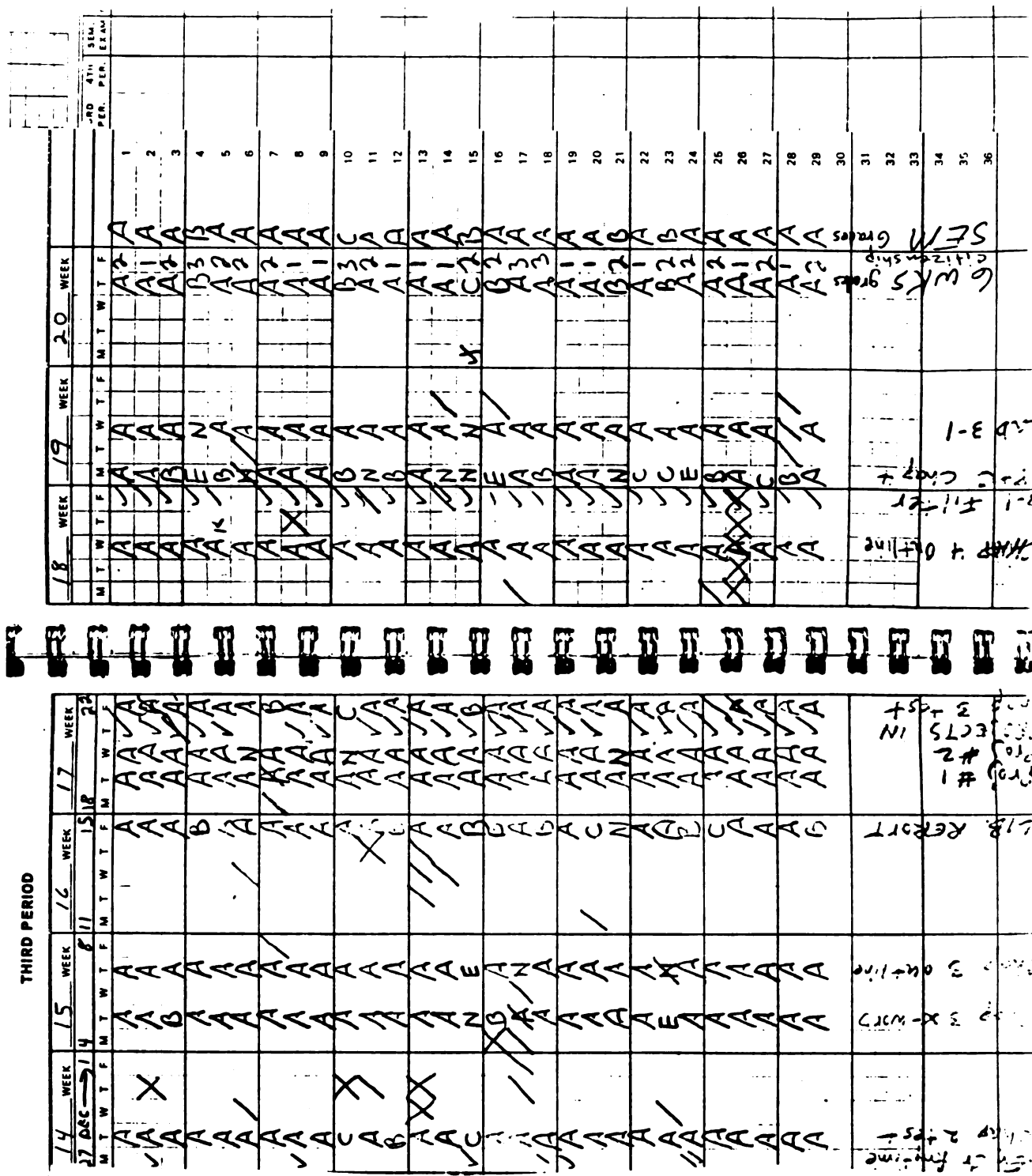
GRADES AND ASSIGNMENTS FOR THE STUDENTS IN GENERAL SCIENCE CLASS



Grades and assignments for the students in the general science class

APPENDIX R

GRADES AND ASSIGNMENTS FOR THE STUDENTS IN ENRICHED SCIENCE CLASS



Grades and assignments for the students in the enriched science class

BIBLIOGRAPHY

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Barker, L. & Joan, C. (1970). Streaming in the primary school. London: National Foundation for Education Research.

Bird. T. (1989). A problem in school teaching: Eclectic deliberation as a form for pragmatic inquiry. Unpublished doctoral disseration, Stanford University.

Byers, L. (1961). Ability grouping--help or hindrance to social and emotional growth. School Review, 69: 449-59.

Cicourel, A.V. & Ketsuse, J.I. (1963). The educational decision makers. Indianapolis: Bobbs-Merrill.

Cowles, M. (1963). A comparative study of certain social and emotional adjustments of homogeneous and heterogeneously grouped sixth grade children. Unpublished doctoral dissertation, University of Alabama.

Dewey, J. (1938). Experience and education. New York: Macmillan.

Drews, E.M. (1963). Student abilities, grouping patterns and classroom interaction. Cooperative Research Program, Office of Education.

Dunn, E.M. (1963). Student abilities, grouping patterns and classroom interaction. Cooperative Research Program, Office of Education.

Dunn, L.C. (1968). Special education for the mildly retarded: Is much of it justifiable? Exceptional Children, 35, 5-22.

Elliot, D.S., Ageton, S.S., & Huizinga, D. (1987). Self-reported delinquency estimates by sex, race, class, and age. Boulder, CO: Behavioral Research Institute, (Report No.8).

Elliott, D.S., Huizinga, D., & Ageton, S.S. (1982). Explaining delinquency and drug use. Beverly Hills: Sage Publications.

Everhart, R.B. (1983). Reading, writing and resistance. Boston: Routledge & Kegan Paul.

Finley, Merrilee (1984). Teachers and tracking in a comprehensive high school. Sociology of Education 57, 233-243.

Findley, W. & Bryan, M. (1975). The pros and cons of ability grouping. Washington, D.C.: NEA.

Findley, W. & Bruan, M. (1971b). Ability Grouping: 1970--II. The impact of ability grouping on school achievement, affective development, ethnic separation and socioeconomic separation. Ed 048382.,

Flowers, C.H. (1966). Effects of an arbitrary accelerated group placement on the tested academic achievement of educationally disadvantaged students. Unpublished doctoral dissertation, Columbia University.

Goodland, J.I. (1983). A place called school. New York: McGraw-Hill.

Goodland, J.I. (1960). Classroom organization. In Chester W. Harris (Ed.). Encyclopedia of educational research, (3rd ed., pp. 221-25), New York: Macmillan.

Hargreaves, D.H. (1967). Social relations in a secondary school. London: Routledge & Kegan Paul.

Hawkes, T.H. & Furst, N.F. (1971). Race, socioeconomic situation, achievement, IQ and teacher ratings of student behavior as factors relating to anxiety in upper elementary school children. Sociology of Education, 44: 333-350.

Hawkins, J.D., Doueck, H.J., & Lishner, D.M. (1988). Changing teaching practices in mainstream classes to improve bonding and behavior of low achievers. American Educational Research Journal, 25(1): 31-50.

Hawkins, J.D., & Weis, J.G. (1985). The social development model: An integrated approach to delinquency prevention." Journal of Primary Prevention, 6: 73-97.

Hirschi, T. Causes of delinquency. Berkeley, CA: University of California Press, 1969.

Keddie, N. (1971). Classroom knowledge. In Michael F.D. Young (Ed.) Knowledge and Control (pp. 133-160) London: Collier Macmillan.

Kelly, D.H. (1975). Tracking and its impact upon self-esteem--a neglected dimension. Education, 96: 2-9.

Labov, W. (1973). The logic of nonstandard English. In Neil Keddie (Ed.). The Myth of Cultural Deprivation. (pp. 21-66) Marmondsworth, England: Penguin.

Lennards, J.L. (1969). The secondary school system in the Netherlands: Some social consequences of streaming.

Levenson, S. (1972). The attitudes and feelings of selected sixth grade children toward reading in ability groups. Unpublished doctoral dissertation, United States International University.

Mahan, Mahan, and Gaillard (1987). Academe and the inner city high school. Unpublished manuscript.

Mann, M. (1960). What does ability grouping do to the self-concept? Childhood Education, 36: 356-60.

McDermott, R.P. (1977). Social relations as contexts for learning in schools. Harvard Educational Review, 47, 198-213.

Metz, Mary (1978). Classroom and corridors. Berkeley, CA: University of California Press.

National Assessment of Educational Progress. The first, second, third, fourth, and fifth assessment of science. (1969), (1973), (1977), (1981), and (1985).

Oakes, J. (1985). Keeping track. New York: Library of Congress.

Office of Technology Assessment, U.S. Congress, 1988.

Olivarri, M.C. (1969). Some relationships of ability grouping to student self-concept. Unpublished doctoral dissertation, University of California, Berkeley.

Page, R. (1988). Teachers' perceptions of students: A link between classrooms, school cultures, and the social order. EJ 356393.

Persell, C.H. (1977). Education and inequality: A theoretical and empirical synthesis. New York: Free Press.

Pidgeon, D.A. (1970). Expectation and pupil performance. National Foundation for Educational Research.

Rawles (1971). A theory of justice.

Rosenbaum, J.E. (1980). Track misperceptions and frustrated college plans. Sociology of Education, 53, 74-88.

Roth, D.R. (1974). Intelligence testing as a social activity. In Aaro V. Cicourel et al. (Eds.). Language use and school performance (pp. 143-217) New York: Academic Press.

Samuda, R.J. (1975). Psychological testing of American minorities. New York: Dodd Mead.

Schrank, W. (1970). A further study of the labeling effects of ability grouping. Journal of Educational Research, 63, 358-360.

Schwartz, F. (1981). Supporting or subverting learning: Peer group patterns. Anthropology and Education Quarterly, 12, 99-121.

Thomas, A. & et al. (1973). Examiner effect in IQ testing of Puerto Rican working-class children. In Erwin Flaxman (Ed.). Educating the disadvantaged (pp. 361-374) New York: AMS Press.

Weis, J.G. (1981). Peer influence and delinquency: An evaluation of theory and practice. Part I and Part II. Washington, D.C.: National Institute for Juvenile Justice and Delinquency Prevention, Office of Juvenile Justice and Delinquency Prevention.

Weis, J.G., & Hawkins, J.D. (1982). Preventing delinquency. National Institute Justice and Delinquency Prevention, Office of Juvenile Justice and Delinquency Prevention, Washington, D.C.: U.S. Government Printing Office.

Wilcox, J. (1963). A search for the multiple effects of grouping upon the growth and behavior of junior high school pupils. Unpublished doctoral dissertation, Cornell University.

Williams, T. (1975). Teacher prophesies and the inheritance of inequality. Paper presented at a the annual conference of the American Sociological Association.