

**A Proposal For Research into the Social,  
Psychological, and Educational Effects  
of Introducing Cooperative Learning into a School System**

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Our grant proposal is divided into the following sections:

- (I) Introduction, which provides an overview of our grant proposal;
- (II) Cooperative Learning, which gives a brief summary of the nature of cooperative learning; (III) Research Design and Research Procedures, which describes the research design and procedures we plan to employ;
- (IV) Research Calendar, which details the anticipated sequence of research activities; and (V) Proposed Budget. In Appendix A, vitas of the key personnel of our staff are provided. In Appendix B, the preliminary plan for training in cooperative learning of the Garden City School System personnel, as developed by Professors David and Roger Johnson of the University of Minnesota, is presented. Appendix C provides additional material on cooperative learning. In Appendix D, some of the research instruments that we are employing are presented.

## I. Introduction

The Garden City School System (GCSS) will be initiating a program of cooperative learning throughout its school district in September 1987. The interest in such a program emerged as a result of a Workshop on cooperative learning and conflict resolution we conducted for administrators and teachers in GCSS on November 23, 1986. GCSS is now in the final process of contracting with Professors David and Roger Johnson of the University of Minnesota's Center for Cooperative Learning to provide a training program for its teaching and administrative staff on how to conduct a program of cooperative learning in its schools and classrooms. GCSS has also enthusiastically agreed to have our Center at Teachers College, under the direction of Professor Morton Deutsch, conduct a five-year research study of the social, psychological, and educational effects of the cooperative learning program upon students, teachers, and administrators. The Superintendent of Schools of GCSS, Dr. Elliott Landon, has also enlisted a neighboring, comparable school district--East Williston--to serve as a control school system that will not initiate a cooperative learning program and in which we will be able to collect data comparable to those collected in GCSS. Also, it should be noted that Professors David and Roger Johnson, who will be responsible for the training program in cooperative learning, have indicated that they will cooperate completely with our research study.\*

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\* Professor David Johnson, a former student of Prof. Deutsch's, has written: "In the 1940's Morton Deutsch, building on the theorizing of Kurt Lewin, proposed a theory of cooperative and competitive situations that has served as the primary foundation on which subsequent research on and discussion of cooperative learning has been based. Our own research is directly based on Deutsch's work". (Circles of Learning, 1986, p. 6)

The rationale for our proposed research is quite simple. There is considerable basis from my own theoretical and experimental work (Deutsch, 1949-1949b, 1973, 1985) and from small scale research studies in classrooms (see reviews in Deutsch, 1985; Johnson et al., 1986; and Slavin, et al., 1985) to believe that "cooperative learning" may have strong beneficial effects on the mental health, social adjustment, and educational achievement of school children. In studies contrasting classrooms organized either to facilitate "cooperative learning" or organized in more traditional ways (which encourage either competitive or individualistic learning), research has shown that cooperative learning encourages more mutual helping among students, more peer support and acceptance, higher self-esteem, more positive expectations about being in school, and greater ability to take the cognitive and affective perspective of others as well as greater academic achievement.

However, these studies have been short-term investigations, usually no longer than three to six weeks, rarely as long as an entire semester. No evidence exists about the longer-term effects of cooperative learning. Additionally, these studies have not investigated what generalized changes occur in students, which go beyond the immediate classroom. We have no knowledge whether or not there are effects on the children's personal and social behavior in the lunchroom, the playground, the school hallways, in their neighborhoods, and in their homes. Further, there has been no study of the effects of cooperative learning which includes the effects upon teachers, staff, and administrators: i.e., a study which would be addressed to examining the entire school environment as it is affected by cooperative learning.

We are planning a five-year, full-scale study of the social, psychological, and educational effects of introducing cooperative learning into an entire school district which will aim to provide knowledge that does not yet exist about: (1) the long-term effects of such a program; (2) the effects that generalize to personal and social behavior outside the classroom; and (3) the effects on teachers, staff, and administrators and other aspects of the total school environment. In addition, we would document the nature of what occurs in the training program and in the classroom under such a program with the objective of characterizing how such a program can be implemented, the kinds of difficulties which occur during its implementation, and how such difficulties can be managed.

We believe that the scope of the program being initiated by the GCSS in cooperative learning and the cooperativeness of all the parties involved in the research (GCSS, the East Williston "control" school district, and the training group led by the Johnsons) provides a unique opportunity to study one of the most potentially significant means of improving the social and psychological well-being of school children. A study, such as the one described in this proposal, would provide school systems and educators throughout the country with a well-documented description of the introduction of a program of cooperative learning, of its implementation, and of the problems which occur during its implementation, as well as a reliable indication of its effects upon various types of school children and upon the social climate of schools.

## II. Cooperative Learning

Appendix B presents a preliminary proposal that the Johnsons have made to implement cooperative learning in Garden City. Appendix C includes their book, Circles of Learning, which describes cooperative learning in considerable detail, as practiced by the Johnsons.

Here, I include an excerpt from their book, Circles of Learning (pp. 6-10), which provides an overview of the nature of cooperative learning.

### The Basic Elements of Cooperative Learning

In Roy Smith's Junior High School English class in Hingham, Massachusetts, students are given the assignment of writing thesis essays on a story, The Choice, which discusses the experience of a time traveler who goes into the future and returns. The class is divided into groups of four, with high-, medium-, and low-achieving students and both male and female students in each group. Seven instructional tasks are assigned over a four day unit:

1. A prereading discussion on what should be taken on a time-travel trip into the future, what should be found out, and what should be told to others on one's return.
2. Each student writes a letter/proposal requesting funding for a time-travel into the future.
3. Group members edit each other's letters/proposals and give suggestions for improvement and mark any errors that need correcting. All revised letters/proposals are handed in with the signatures of the group members who edited them.
4. Each member reads the story, The Choice, and makes a tentative interpretation of its meaning.
5. Group members discuss the story and reach consensus on the answers to seven questions about its content.

6. Each student writes a composition, taking the position that the decision made by Williams was correct or incorrect and presenting a convincing rationale as to why his or her position is valid.
7. Group members edit two other members' compositions. Careful editing for spelling, punctuation, and the components of thesis essays is emphasized. All revised compositions are handed in with the signatures of the group members who edited them.

Within this lesson positive interdependence is structured by having each group start out with 100 points, and subtracting 5 points for every spelling or punctuation error and every failure to include the essential elements of thesis essays. The group is given 20 bonus points if every member clearly articulates an interpretation of the story and supports it with valid reasoning. Individual accountability is ensured by requiring each student to write the letter/proposal and essay and revise them to meet the standards of his or her groupmates. The collaborative skill of criticizing ideas without criticizing the person is explained by the teacher and practiced by the students. Finally, the group spends some time during the final class session processing how well they worked together and what they could do in the future to be an even more effective group member. This lesson illustrates the basic elements of cooperative learning.

Many educators who believe that they are using cooperative learning are, in fact, missing its essence. There is a crucial difference between simply putting students into groups to learn and in structuring cooperative interdependence among students.

Cooperation is not having students sit side-by-side at the same table to talk with each other as they do their individual assignments. Cooperation is not assigning a report to a group of students where one student does all the work and the others put their names on the product as well. Cooperation is much more than being physically near other students, discussing material with other students, helping other students, or sharing material among students, although each of these is important in cooperative learning. There are four basic elements that must be included for small group learning to be truly cooperative.

The first is positive interdependence. Students must perceive that they "sink or swim together." This may be achieved through mutual goals (goal interdependence); divisions of labor (task interdependence); dividing materials, resources, or information among group members (resource interdependence); assigning students roles (role interdependence); and by giving joint rewards (reward interdependence). In order for a learning situation to be cooperative, students must perceive that they are positively interdependent with the other members of their learning group.

Second, cooperative learning requires face-to-face interaction among students. There is no magic in positive interdependence in and of itself. It is the interaction patterns and verbal interchange among students promoted by the positive interdependence that affect education outcomes.

The third basic element of cooperative learning is individual accountability for mastering the assigned material. Each group member is responsible for learning the assigned material. The purpose of a learning situation is to maximize the achievement of each individual student. Determining the level of mastery of each student is necessary so that students can provide appropriate support and assistance to each other.

Finally, cooperative learning requires that students appropriately use interpersonal and small group skills. Placing socially unskilled students in a learning group and telling them to cooperate obviously will not be successful. Students must be taught the social skills needed for collaboration and be motivated to use them. Students must also be given the time and procedures for processing (i.e., analyzing) how well their learning groups are functioning and the extent to which students are employing their social skills to help all group members to achieve and to maintain effective working relationships within the group.

#### The Differences Between Traditional Group And Cooperative Learning

There are a number of differences between the typical use of classroom learning groups and cooperative learning groups. These differences are:

1. Cooperative learning groups are based on positive interdependence among group members in which goals are structured so that students need to be concerned about the performance of all group members as well as their own.

2. In cooperative learning groups there is a clear individual accountability where each student's mastery of the assigned material is assessed, each student is given feedback on how each member is progressing so that the other group members know whom to help and encourage. In traditional learning groups individual students are not often held individually accountable for providing their share of the group's work and occasionally students will "hitchhike" on the work of others.
3. In cooperative learning groups the membership is typically heterogeneous in ability and personal characteristics, while traditional learning groups are often homogeneous in membership.
4. In cooperative learning groups all members share responsibility for performing leadership actions and there is no formal leader, while in traditional learning groups a leader is often appointed and given charge of the group.
5. In cooperative learning groups responsibility for each other's achievement is shared. Group members are expected to provide help and encouragement to each other in order to ensure that all members do the assigned work. In traditional learning groups members are seldom held responsible for each other's learning.
6. In cooperative learning groups, students' goals focus on both maximizing each member's learning and maintaining good working relationships among members. In traditional classroom learning groups students most often focus only on completing the assignment.
7. In cooperative learning groups, the social skills students need to work collaboratively (such as leadership, communication, trust-building, and conflict management) are directly taught, whereas in traditional classroom learning groups the interpersonal and small group skills students need to work together effectively are assumed.
8. When cooperative learning groups are used the teacher observes the groups, analyzes the problems they have working together, and gives

feedback to each group on how well they are working together. In traditional learning groups teacher observation and intervention seldom take place.

9. In cooperative learning the teacher structures procedures for groups to "process" how effectively they are working, while in traditional learning groups no group processing takes place.

### III. Research Design and Procedures

The research which is being planned is a longitudinal study with a control, comparison school system in which measurements of various sorts will be taken at periodic intervals over a four-year period. The Garden City School District and the East Williston School District are both excellent choices for a longitudinal study since both school districts are characterized by relatively stable populations. It is reasonable to expect that a high proportion of the students in each of the two districts will be in residence during the entire period in which the research will be underway. The two school districts are also good districts for a comparative study: they are geographically close and both are located in areas which are reported, by the school authorities, to have similar socioeconomic, ethnic, and religious backgrounds. Both districts are in suburban communities which are largely inhabited by upper-middle class, white families.

In addition to the stable population, similar socioeconomic and ethnic backgrounds, there are other reasons why the Garden City and East Williston school districts are ideal sites for our research program. These are discussed below:

- 1) One important reason is the fact that both school districts are already committed to our program of research, as evidenced by the letters

of support appearing just before Appendix A. However, this commitment does not stop with the Superintendent. It is district- and community-wide. For example, during our visits to GCSS, many teachers have approached us with interest and excitement over the possibilities of becoming involved in the program. The police liaison officer, who works closely with youth in the schools on a full-time basis, is committed to district programs and would be most helpful to us. Furthermore, the Assistant Superintendent is so interested that she has asked to be involved with us in the Johnsons' training workshop in July. As the Johnsons have commented, this level of commitment is crucial to the success of the cooperative learning training. Without it, a training program is liable to die out. This is especially important for sustaining a long-term program such as this one. Therefore, if we are to evaluate such a program, it seems wise to commit energy and resources where the training has the greatest chance of succeeding.

2) The issue of evaluating a program that has the best chance of succeeding is central to why we are not looking to inner-city school sites at this time. We do not believe "cooperative learning" would be sufficient by itself to make a powerful difference in inner-city school sites. There is too much absenteeism and too much turnover among the school children to yield any kind of stable population for cooperative learning training or long-term research; the inadequate physical security, the poorly maintained buildings, and the lack of school resources present other problems; the poor morale among school personnel would be another obstacle. If "cooperative learning" were to be implemented in a problem-ridden, inner-city school, it would have to be part of a larger program that would have to address many other school issues also. We believe it might be possible to mount such a

program. However, it would be considerably more ambitious and costly than what we are proposing to do in Garden City. Were we to undertake such a program, we would only want to do it when we were confident that "cooperative learning" was effective under more favorable circumstances.

3) Another issue deals with existing base rates of mental health. So far as we know, comparable base rates of the problems that we hope to measure and to affect do not exist anywhere for school districts or communities. We are referring to level of self-esteem, social adjustment, symptoms of depression, psychosomatic symptoms, alienation, attitudes toward school, etc. There are undoubtedly some measures of gross problems--crime, drug use, disciplinary problems, suicide, etc.--that are obtainable but are not likely to be comparable between different types of school districts. For these reasons, we believe it would not be a wise expenditure of research effort nor funds to attempt to get base rates for a number of different communities. However, preliminary testing (pretesting) conducted in January will give us base rates for the Garden City and East Williston communities with respect to the aforementioned variables. Furthermore, since these communities are so similar, base rates will be more comparable. For reasons we outlined above, we consider the Garden City School District to be a better site for our study than an inner-city school district which might have a higher base rate of gross problems. Let us note that the data we plan to collect about the school children in Garden City and East Williston will be a uniquely rich data set about the mental health of children in fairly typical suburban school settings.

It is evident, however, from our discussions in Garden City that it does have ample stress and mental health problems. The community has developed a community awareness program for alcohol and drug abuse out

of concern for these issues among the children and youth in Garden City. The teachers that we have spoken to have described the usual emotional problems of children and adolescents--depression, acting out, social withdrawal, anxiety, psychosomatic problems--but they have also indicated that the intense competitiveness in the Garden City schools seems to heighten such problems. As the letter from the Assistant Superintendent indicates (located just before Appendix A), the community and school district are quite concerned with these social and mental health issues, and have set up numerous, community-sponsored programs in an effort to educate parents, teachers, and students in order to combat these problems.

In sum, Garden City is a particularly good place to do the sort of research we have in mind for several reasons. It has enough problems to give "cooperative learning" a fair chance to make a significant difference, and not such severe problems that "cooperative learning" would be insufficient by itself to produce a difference; it has a relatively stable school population so that the children can be followed over several years without fear of excessive turnover; and "cooperative learning" and our research would have the enthusiastic support and cooperation of the Garden City School System.

We plan to employ a variety of measures in each of the two school districts: achievement measures in various school subject matters; questionnaire measures of school related attitudes, of social relations, and of mental health; observational measures of what goes on in selected classrooms; observational measures of behavior in selected school areas--the lunchroom, hallways, recreation areas, school events--and in selected community areas where students congregate; measures to be obtained from school, police, and other community records of absenteeism, violence, crime, suicide, drug

abuse, and also of various forms of prosocial behavior. In addition to the measures related to the students, we plan to administer questionnaires to the teachers and administrators that will measure their school related attitudes, their perceptions of the "school climate," their orientation to "cooperative learning" and other forms of classroom organization. In addition, we shall obtain measures of parental attitudes towards the schools.

There are approximately 3,100 students and 270 teachers and administrators in the GCSS and a roughly similar number in East Williston. Our plan is to administer the questionnaire measures to the entire school population in each school district as well as to obtain the achievement data on each student. The first full-scale collection of such data would occur in January 1988; however, in October 1988, shortly before the training of teachers in cooperative learning procedures begins, questionnaires will be administered to teachers and administrators. The next full-scale collection of data will be toward the end of the school year in 1988. In 1989, 1990, and 1991, such data would only be collected near the end of the school year.

We believe that it will be useful to have large numbers since we shall want to "break down" our student population in terms of a number of variables: (1) school district; (2) school within district; (3) grade level; (4) initial\* general achievement level; (5) gender; (6) initial mental health status; (7) initial school attitudes; (8) family characteristics; and (9) by a number of the characteristics of the teacher(s) to which the students are exposed. We shall also want to "break down" our teachers in terms of such variables as: (1) years of experience; (2) gender; (3) initial attitudes toward "cooperative learning"; and (4) initial attitudes toward being a teacher.

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\*"Initial" refers to the time of the first measurement in our study.

Unlike the questionnaires, our observation of what goes on in the classroom (of teacher and student behavior) will be limited in the first year of the study to the following grade levels: kindergarten, third grade, sixth grade, and ninth grade. In each subsequent year, we shall follow the classroom group initially observed to the next higher grade level: kindergarten to first to second to third; third to fourth to fifth to sixth; etc. Over the four-year period of our study, by this design, we will be observing in classrooms from kindergarten to the last year in high school, and we shall be observing a number of cohorts of students for four successive years. At each of the selected grade levels, the classrooms of two teachers will be observed. In GCSS, the teachers will all have had training in cooperative learning; the teachers in the comparable grades in East Williston will not have had such training but will be selected to be of similar teaching experience. Observations of each classroom, on three days, will be made at each of three different periods during the year: early in the Fall, in Winter, and late in Spring. Teachers will also be requested to keep a simple diary of classroom activities.

Similarly to the above, systematic observation of student behavior (focusing on prosocial, asocial, and antisocial actions) will be made at selected school sites in each school at three different periods during the year. The sites that are selected will be ones where there is considerable observable student interaction: the lunchroom, recreational areas, hallways, etc. In addition, observations and interviews will be made at selected sites in the community which students use or where students tend to "hang out." The interviews would be with salespeople, shopkeepers, service people, etc. who have frequent contact with the students. The emphasis

in the interviews and observations would be on prosocial, asocial, and antisocial behavior and what recent changes may have been noted in such behaviors. We do not plan to engage in interventions outside the schools. Not only would actual interventions in the community (i.e., actively trying to influence police and shopkeeper attitudes) be difficult and impractical, it would require a much more involved and costly research program than that which we are proposing. On the contrary, we wish to see whether the school intervention will affect behavior in non-school settings. The degree of transference (if any) of cooperative behavior from school sites to non-school settings is an important aspect of the evaluation of the training program. As community "ripple effects" are more likely to reveal themselves after a few years rather than immediately, it is especially important to be able to measure the process over a period of time. We have this opportunity in Garden City. We shall, of course, not primarily focus on negative behaviors that have such a low base rate that little change can be expected. We shall be examining politeness, helpfulness, and other forms of prosocial behavior as well as such forms of negative behavior as rudeness, littering, disorderliness, in addition to statistics on delinquency, drug abuse, accidents, etc.

The opportunity that has been created by the decision of the GCSS to institute a program of cooperative learning is a rare chance to conduct a systematic research study of the effects of a potentially important influence on the mental health of school children. This opportunity has arisen quite recently and it is evident that a well-conducted study will be a large scale effort that requires careful, detailed planning. In the short time since the possibility of doing the research in Garden City has emerged, my (volunteer)

students and I have been involved in the process of developing and piloting the instruments, of collecting the knowledge we need about the school districts, and of obtaining the necessary information about the details and scheduling of the proposed training in cooperative learning.

In the next section, we present a calendar of the activities we propose to undertake through December of 1988, and in the subsequent section, we present a proposed budget for the period of January 1, 1988-December 31, 1988 which would take us through the entire first year of our research.

#### IV. Schedule of Research Activities

This section of the proposal reviews the schedule of research activities in detail. Figure 1, located at the end of this section, presents the schedule in calendar form for more convenient reference.

#### Finalizing the Sample and Developing the Instruments

We are currently in the process of obtaining the precise number of children and teachers at each grade level of interest, with respect to our target (GCSS) and control or comparison (East Williston) schools. At the present time we are pilot testing the student questionnaire which is presented in Appendix D. This measure includes such instruments as the Norwicki-Strickland Locus of Control Scale for Children (1972), Rotter's Internal-External Locus of Control Scale (1966) for adults, and Rosenberg's Self Esteem Scale (1965) as well as measuring mental health, attitudes toward school, and interpersonal social skills. A similar scale for teachers, which is also presented in Appendix D, is currently being tested as well. We will make final revisions upon completion of the pilot testing. We are also in the process of developing additional measures of mental health involving such issues as drug and alcohol abuse, psychosomatic problems, and depression.

#### Pilot Testing

We will continue to pilot our research instruments through the summer in order to determine such factors as length of testing time, comprehension of instruments, and administration procedures. As previously mentioned, we are pilot testing the questionnaire, containing measures of mental health, school attitudes, and social skills, as well as a separate measure of problem solving. Pilot work is being conducted on a sample of approximately

300 students, as well as a smaller sample of teachers. No pilot work will be done with administrators, as they will be given the same questionnaire and problem-solving measure as the teachers. Pilot testing is being conducted in a similar school system to GCSS and East Williston.

After piloting, we anticipate revision of the instruments, and the printing of the final version of instruments to occur in September.

### Training

As explained in the Johnsons' preliminary training plan (Appendix B), training will begin with a core group of teachers over the fall and winter months. The training program is being funded entirely by GCSS, and will proceed according to the plan outlined in Appendix B during the academic year 1987-88. Key members of our staff, such as the research director, training director, and research assistants, will attend these training sessions, as well as the Johnsons' training workshop in July, 1987.

### Parental Factors

In the beginning of January, parents in both the GCSS and East Williston will be given a brief questionnaire to assess their attitudes toward the schools in each district. This will also provide us with information concerning potential influences on the child at home. We are also scheduling a series of meetings in September to discuss such issues of concern as parental attitudes and potential union influence with respect to the implementation of the entire program.

## Pretesting

### Questionnaires and Problem Solving

Initial testing (hereafter referred to as "pretesting") in the GCSS and East Williston will occur for both teachers and administrators early in October, 1987. This will include the questionnaire and problem solving measure. It is important to pretest these adults as early as possible, so as to avoid interfering with their curriculum planning or classroom work and before any extensive training in cooperative learning takes place. Pretesting of students, also involving the questionnaire and problem solving measure, will take place in January.

### Observations and Interviews

Observations of selected school sites as well as selected community areas will be conducted in February of 1988. In addition, we will be talking with security guards and janitors at the school sites, as well as shopkeepers and police in the community at this time. We will also conduct these observations in May.

Selected classroom observations involving students and teachers will also be conducted in both school systems. For GCSS these observations will focus on how well the students seem to be participating in cooperative education (i.e., do they seem to understand what to do, how efficiently do they form learning groups, how well does the teacher work with them?), as well as ascertaining the general classroom "climate." For example, how comfortable or happy do the students seem? Is the atmosphere tense or relaxed? We are planning three observations of two classes at each of the grade levels K, 3, 6, and 9 in January, May, and October yielding

a total of 72 classroom observations. These will be conducted in as unobtrusive a manner as possible. We also anticipate that as the research progresses, students and teachers will become quite used to our presence resulting in minimal disruption. Observations will also be made in the same grades in East Williston in order to be able to compare the two school systems in terms of what goes on in their classrooms. In addition to these observations the training director, in cooperation with the teachers, will be visiting classrooms regularly in order to aid teachers in their implementation of cooperative learning, and to ensure that it is being implemented correctly.

#### Achievement Measures

At this time standardized achievement scores that are routinely collected by the school districts are to be collected by the researchers in November, 1987 and July, 1988. However, the accuracy of this time schedule will largely depend on when these scores will be made available to us.

#### First Posttest

As Figure 1 shows, the first posttesting (i.e., "testing" at the end of the first school year) will occur in May, 1988. This will involve administering to the students, teachers, and administrators questionnaires as well as the problem solving measure. It will also include the end of the school year observations and interviews involving the school sites, community, and classroom as previously described.

Figure 1. GARDEN CITY EVALUATION RESEARCH CALENDAR 1987-1988

Tasks	Sept		Oct		Nov		Dec		Jan		Feb	
	1	2	1	2	1	2	1	2	1	2	1	2
1. Sample (T) Treatment (C) Comparison (P) Pilot	Get class lists from teachers with stu's names for coding ID numbers	tea-teachers stu-students adm-administrators A=adults (includes tea & adm) par=parents K=Kindergarten										
2. Instruments	Printing Final Version of Instruments											
3. Assessment	Q=Questionnaire I=Interview Schedules O=Behavioral Observation Ach=Achievement Tests PS=Problem Solving		Q PS tea adm						T/C Pretesting Q I O p a r PS O 3 S K 6 t u 9	I O S I O s I O C O m m		
4. Training					Level 1 (Preliminary) Training							Level 2 Training
5. Implementation Process Evaluation	Meeting for discussing parental/union issues				Teachers Implement Cooperative Learning in Classrooms						X	
6. Data Analysis					<-----Collect Ach----->							21



## V. Budget

The budget that is presented is for the period, January 1, 1988-December 31, 1988. We have selected January 1, 1988 as the starting date under the assumption that it is the earliest time that funds could be granted to us. If an earlier starting date were possible, it would be helpful. It would not be inappropriate, from our perspective, to start as early as September 1, 1987.

A detailed budget is presented only for the first year. We would expect the budgets for the second, third, and fourth years to be similar to the first year's except for salary and inflationary increases. We assume a 4% increase in total costs for each of these years. In the fifth and final year, we assume a decrease in costs of about 30 percent because of the decreased data collection.

The research requires a number of key personnel. Their functions are briefly described, and their identities, when known, are indicated.

Principal Investigator. Prof. Morton Deutsch will provide direction and overall supervision of the research study from its beginning to its conclusion.

Research Director. Dr. Susan Boardman will provide day-to-day direction of the conduct of the research and will supervise the execution of the various research activities at the two research sites.

Training Director and School Liaison. Ms. Ellen Raider will have the responsibility of documenting the training of teachers and supervisors in cooperative learning, of documenting what occurs in the way of cooperative learning in GCSS, and of meeting regularly with teachers who are employing cooperative learning methods to document their specific experiences, their