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An Observational Study of Instructional and Curricular Practices Used With Gifted and Talented Students in Regular Classrooms

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The participating universities include The University of Georgia, The University of Virginia, and Yale University, as well as a research unit at The University of Connecticut.

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ABSTRACT

The Classroom Practices Study conducted by The National Research Center on the Gifted and Talented (NRC/GT) examined the instructional and curricular practices used with gifted and talented students in regular third and fourth grade classrooms throughout the United States. Descriptive information about these practices was obtained from surveys and classroom observations. This report describes the procedures used in the study and the results obtained from systematic observations of gifted and talented students in 46 third and fourth grade classrooms. The observations were designed to determine if and how teachers meet the needs of gifted and talented students in regular classroom settings. The Classroom Practices Record (CPR) instrument was developed to document the types of differentiated instruction that these students receive through modifications in curricular activities, materials, and teacher-student verbal interactions. Descriptive statistics and chi-square procedures were used to analyze the CPR data. The results indicated that little differentiation in the instructional and curricular practices, including grouping arrangements and verbal interactions, was provided for gifted and talented students in regular classrooms. Across five subject areas and 92 observation days, gifted students received instruction in homogeneous groups only 21 percent of the time, and the target gifted and talented or high ability students experienced no instructional or curricular differentiation in 84 percent of the instructional activities in which they participated.

ACKNOWLEDGMENT OF OBSERVERS

We would like to thank the following individuals who conducted classroom observations for the study. We appreciate the time, effort, and skill they demonstrated in the observations they conducted for The National Research Center on the Gifted and Talented.

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EXECUTIVE SUMMARY

The success of education depends on adapting teaching to individual differences among learners. -- Yuezheng, in fourth century B.C. Chinese treatise, Xue Ji (Snow, 1982)

Most gifted and talented students spend the majority of their school time in regular classroom settings; yet, a substantial number of educators and researchers believe that many, if not most, classroom teachers have neither the background, nor the experience to meet these students' needs (Council of State Directors, 1987; Cox, Daniel, & Boston, 1985). Little significant research has been conducted to determine whether classroom teachers provide adequate challenge or different experiences to gifted students. In response to this need, The National Research Center on the Gifted and Talented (NRC/GT) conducted the Classroom Practices Study to examine the instructional and curricular practices used with gifted and talented students in regular classrooms throughout the United States. Descriptive information about these practices was obtained from teacher surveys (Archambault, Westberg, Brown, Hallmark, Zhang, & Emmons, 1992) and classroom observations. This executive summary provides a brief overview of the rationale for the observational study, the procedures used to gather the observational data, and the results from nonparticipant observations in 46 third and fourth grade classrooms throughout the United States. Specific information about the study is described in the complete research monograph (Westberg, Archambault, Dobyns, & Salvin, 1993).

Statement of the Problem

The problem addressed in this study was twofold. First, it is widely accepted among educators of gifted and talented students that the greatest problems facing gifted and talented students are (1) the lack of challenge in the regular curriculum and (2) students' previous mastery of content and skills. Several research studies have supported

this claim by investigating students' mastery of material before it has been presented to them, and by examining the challenge level represented in the textbooks provided to these students (Bernstein, 1985; EPIE, 1979; Kirst, 1982; Sewall, 1988; Taylor & Frye, 1988). Studies have found, also, that gifted and talented students are often unchallenged by the instruction provided to them in the regular classroom. Lutz and Lutz (1980), in an ethnographic study of gifted students in elementary school settings, concluded:

> In the regular classroom, teachers would involve gifted pupils in discussion and social activities; but in the general activities (especially arithmetic), they simply accelerated the work in quantity and in grade level to some extent. This was accepted by the gifted pupils with considerable boredom but without complaint. (p. 22)

The second aspect of the problem is concerned with the effect of special programs for the gifted on classroom teachers' practices with gifted and talented students. Little research has addressed whether the existence of gifted and talented programs in schools affects classroom teachers' practices with gifted students. Are classroom teachers in schools that have special programs for the gifted more likely to offer differentiated curricular experiences than teachers in schools where no special programs exist?

The general questions addressed in this study were, therefore, (1) What curricular and instructional practices are used in regular classrooms with gifted and talented students? and (2) Does the presence of a gifted program in a school change the regular classroom practices used with gifted and talented students?

Background of the Study

Nearly all gifted and talented students in this country spend most of their school day in the regular classroom. Morris (1989) said, "For the vast majority of gifted students, the regular classroom continues to remain the primary center for their education. Given this situation, the key component for designing educational programs remains with the classroom teacher" (pp. 50-52).

Advocates for gifted and talented students have described educational practices that should be provided to these students. Leaders in gifted education have long argued that a student's educational program should be determined by his or her needs, abilities, and interests (Gallagher, 1985; Maker, 1982; Parke, 1989; Passow, 1982; Renzulli, 1977; Ward, 1980) and that any single educational experience will not benefit all students equally (Parke, 1989; Stewart, 1982). As early as 1955, Passow stated that in terms of ability, *equality* of educational opportunity did not mean *identical* opportunity. He said, "Where ability is concerned, equality consists of providing equally well for all kinds and levels of individual differences" (p. 165).

The literature indicates a number of practices that could be used to meet the unique needs of gifted and talented students in the regular classroom. The methods

available for providing curricular and instructional differentiation include ability grouping, self-selected independent study, acceleration, higher cognitive processing, and questioning strategies (Bloom, 1956; Gallagher & Aschner, 1963; Kaplan, 1979; Maker, 1986; Parke, 1989; Passow, 1982; Renzulli & Reis, 1986; Treffinger, 1986). This observation study was designed to document various types of differentiation employed in regular classrooms.

Procedures

Structured observations were conducted in 46 third and fourth grade classrooms that represented school districts within the four regions of the country (i.e., Northeast, North Central, South, and West) designated by the U.S. Census Bureau and districts in rural, suburban, and urban communities. Twenty-six schools provided formal gifted education programs, and twenty classrooms were in schools that did not have formal gifted programs.

Two students, one gifted and talented and one average ability student, were selected as target students for each observation day. By observing these two students, it was possible to compare the curriculum and instruction provided to gifted and talented and average ability students in the same classroom. Trained observers spent two days observing target students in each classroom; therefore, across the 46 sites, 92 target students of each ability level were observed. Observers used student roster information provided in advance by classroom teachers and a specific protocol to select the target students for each observation day. Systematic procedures were developed to ensure the inclusion of minority or economically disadvantaged students in the sample and students of equivalent ability levels.

An observational instrument entitled the Classroom Practices Record (CPR) (Westberg, Dobyns, & Archambault, 1990) was developed to document the extent to which gifted and talented students receive differentiated instruction through modifications in curricular activities and materials and through verbal interactions with teachers. The CPR contains six sections: Identification Information, Physical Environment Inventory, Curricular Activities, Verbal Interactions, Teacher Interview Record, and Daily Summary. Several field trials of the Classroom Practices Record were conducted to provide satisfactory evidence of its validity and reliability before it was used in the study.

Nonparticipant observation and semi-structured interviews were selected as the data-gathering techniques for this study. The procedures for conducting them were outlined in the instrument's training manual. After reading the manual and completing the training exercises within it, the observers completed a training exercise, which was a simulation of a classroom discussion, to establish evidence of the reliability of their codings.

Descriptive and inferential statistical procedures were used to analyze the data collected by the observers. Descriptive statistical procedures were used to compute the frequencies for all variables and address the research questions dealing with the types of instructional activities, grouping arrangements, and types of differentiation experienced by target gifted students. The data that were collected for the research questions dealing with verbal interactions were analyzed through nonparametric statistical procedures. In addition to these analyses, a content analysis procedure was used to examine the anecdotal information from the daily summaries recorded on the CPR by the observers.

Results

The results of the analyses indicated that the target gifted and talented students received a limited amount of differentiation in reading, language arts, mathematics, science, and social studies instruction. For purposes of this study, six codes were used to record evidence of differentiation: advanced content instruction, advanced process instruction, advanced product or project instruction, independent study with assigned topics, independent study with self-selected topics, and other differentiation experiences. Across all five subject areas, the target gifted and talented students experienced no instructional or curricular differentiation in 84 percent of the activities in which they participated (see Figure 1). The greatest amount of differentiation occurred in mathematics, with target students receiving advanced content instruction in 11 percent of the mathematical activities.

Fourteen types of instructional activities were coded within each subject area: audio visual, demonstration, discussion, explain/lecture, games, non-academic activity, oral reading, project work, review/recitation, silent reading, simulation/role playing, testing, verbal practice or performance, and written assignments. Of the fourteen activities, the gifted and talented students spent the majority of the time doing written assignments and listening to explanations or lectures across all five subject areas. Target gifted and talented students were heterogeneously grouped for the majority of the instructional time in all subjects.

Several analyses were conducted on the types of questions teachers asked (knowledge/ comprehension and higher order) and the pre-response wait time associated with questions teachers provided to both groups of target students. These analyses were conducted across all sites and separately for students in gifted program and no-program schools. No significant differences in the types of questions (knowledge/comprehension versus higher order questions) were found between target students across all sites, within program schools or within no-program schools. A significant chi-square value was found between the two groups of target students with regard to questions accompanied by wait time. That is, significantly more wait time was provided to target average ability students than to target gifted students, however, the phi coefficient indicated that the strength of this difference was low.

The results of the content analysis procedure, conducted to examine the observers' anecdotal records on the daily summaries, corroborated the findings from the descriptive and chi-square statistical results. That is, a limited amount of differentiation was found in the instructional and curricular practices for gifted and talented students in the regular classroom.

Summary and Discussion

Despite several years of advocacy and efforts to meet the needs of gifted and talented students in this country, the results of the observational study indicate that little differentiation in the instructional and curricular practices, including grouping arrangements and verbal interactions is provided to gifted and talented students in the regular classroom. This is of particular concern when special programs for gifted learners outside of the regular classroom are being eliminated or reduced in many parts of the country because of economic difficulties.

Several implications from this study should be considered, especially if gifted education is to become increasingly mainstreamed or provided in the regular classroom. These implications apply to all who share in the responsibility for educating gifted learners in the regular classroom, namely, administrators, gifted education specialists, curriculum consultants, guidance personnel, parents, and classroom teachers.

The results from this study suggest that preservice and inservice training practices need to be modified and increased. Teacher preparation programs should provide preservice teachers with awareness of the need and opportunities to practice techniques for meeting the needs of high ability students in the classroom. Most college or university teacher preparation programs provide only one or two class sessions on this topic. Inservice training for classroom teachers should include specific strategies for meeting the needs of gifted and talented students in the regular classroom, and in addition to presenting information about these strategies, strong encouragement to "experiment" with these strategies.

School administrators and boards of education should acknowledge that many classroom teachers have large class sizes and a significant number of students with special needs or handicapping conditions, making teachers' tasks for meeting the individual needs of all students increasingly challenging. Therefore, accommodations, such as cluster grouping for subjects or resource programs, should be provided to enable classroom teachers to meet the needs of bright students.

The results from this study suggest that the role of the gifted education specialist or other staff development personnel in a school district should be modified to include assistance to classroom teachers. This does not mean that special programs, such as pull out resource programs should be eliminated; rather, gifted education specialists should include consultation or collaboration with classroom teachers among their responsibilities. In fact, in addition to concluding from this observational study that

different practices need to be provided to gifted students in the regular classroom, a convincing argument should be made for retaining special programs for the gifted and talented students.

The generalizability of the results found in this research are limited to third and fourth grade classrooms that volunteered to be part of the study. It must be acknowledged that observations in a few of the third and fourth grade classrooms in this study indicated that some differentiation in the instruction and curricular practices was provided to target gifted students. Unfortunately, this occurred infrequently and suggests that the needs of gifted and talented students are not being met in the majority of regular classrooms.

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The problem addressed in this study was twofold. First, it is widely accepted among educators of gifted and talented students that the greatest problems facing gifted and talented students are (1) the lack of challenge in the regular curriculum and (2) students' previous mastery of content and skills. Several research studies have supported this claim by investigating students' mastery of material before it has been presented to them, and by examining the challenge level represented in the textbooks provided to

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An instrument entitled the Classroom Practices Record (CPR) (Westberg, Dobyns, & Archambault, 1990) was developed to record information about the occurrences and types of instructional and curricular differentiation provided by regular classroom teachers to target students. The instrument contained six sections, including a section for recording the types of verbal interactions that occur in the classroom. Several field trials of the Classroom Practices Record were conducted to improve evidence of its validity and reliability.

Nonparticipant observation and semi-structured interviews were selected as the data-gathering techniques for this study. The procedures for conducting them were outlined in the instrument's training manual. After reading the manual and completing the training exercises within it, the observers completed a training exercise, which was a simulation of a classroom discussion, to establish evidence of the reliability of their codings.

Quantitative and qualitative procedures were used to analyze the data collected by the observers. Descriptive and chi-square statistical procedures were used to address the research questions concerned with the differentiation experiences and the verbal

interactions observed in the classroom. A content analysis procedure was used to examine the anecdotal information from the daily summaries recorded on the CPR by the observers.

Results

The results of the analyses indicated that the target gifted and talented or high ability students received a limited amount of differentiation in reading, language arts, mathematics, science, and social studies instruction. For purposes of this study, six codes were used to record evidence of differentiation: advanced content instruction, advanced process instruction, advanced product or project instruction, independent study with assigned topics, independent study with self-selected topics, and other differentiation experiences. Across all five subject areas, the target gifted and talented or high ability students experienced no instructional or curricular differentiation in 84 percent of the activities in which they participated. The greatest amount of differentiation occurred in mathematics, with target students receiving advanced content instruction in 11 percent of the mathematical activities.

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The results of the content analysis procedure, conducted to examine the observers' anecdotal records on the daily summaries, corroborated the findings from the descriptive and chi-square statistical results. That is, a limited amount of differentiation was found in the instructional and curricular practices for gifted and talented students in the regular classroom.

Summary and Discussion

Despite several years of advocacy and efforts to meet the needs of gifted and talented students in this country, the results of the observational study indicate that little differentiation in the instructional and curricular practices, including grouping arrangements and verbal interactions is provided to gifted and talented or high ability students in the regular classroom. This is of particular concern because special programs for gifted learners outside of the regular classroom are being eliminated or reduced in many parts of the country because of economic problems.

Several implications from this study should be considered, especially if gifted education is to become increasingly mainstreamed or provided in the regular classroom. These implications apply to all who share in the responsibility for educating gifted learners in the regular classroom, namely, administrators, gifted education specialists, curriculum consultants, guidance personnel, parents, and classroom teachers.

The results from this study suggest that preservice and inservice training practices need to be modified and increased. Teacher preparation programs should provide preservice teachers with awareness of the need and opportunities to practice techniques for meeting the needs of high ability students in the classroom. Most college or university programs in teacher education provide only one or two class sessions on this topic. Inservice training for classroom teachers should include specific strategies for meeting the needs of gifted and talented students in the regular classroom, and in addition to presenting information about these strategies, strong encouragement to "experiment" with these strategies.

School administrators and boards of education should acknowledge that many classroom teachers have large class sizes and a significant number of students with special needs or handicapping conditions, making teachers' tasks for meeting the individual needs of all students increasingly challenging. Therefore, accommodations, such as cluster grouping for subjects or resource programs should be provided to enable classroom teachers to meet the needs of bright students.

The results from this study suggest that the role of the gifted education specialist or other staff development personnel in a school district should be modified to include assistance to classroom teachers. This does not mean that special programs, such as pull out resource programs should be eliminated; rather, gifted education specialists should include consultation or collaboration with classroom teachers among their responsibilities. In fact, in addition to concluding from this observational study that different practices need to be provided to gifted students in the regular classroom, a convincing argument should be made for retaining special programs for the gifted and talented students.

CHAPTER 2: Review of the Literature

Introduction

In spite of frequent criticism regarding the inappropriateness of traditional instructional methods for high ability students, many aspects of the American classroom have remained the same since the industrial revolution (Good & Brophy, 1987). After the industrial revolution, the population shifted to the cities; "public schools became larger and education became more standardized and formalized" (p. 352). The basis for assigning students to classes became age, not abilities or previously mastered material. Each grade level followed standards and curriculum guidelines established just for that particular grade level, and commercially-prepared textbooks and tests became regular practice for teachers.

During the 20th century various educational movements have offered solutions to problems associated with a standardized system of instruction. However, these solutions have been shortlived because of religious, fiscal, and political concerns, and thus, they have had little lingering effect on the contemporary American classroom. The practice of adapting instruction to individual differences among students in the same classroom has fallen victim to practical and economic issues such as class size, age differences, teacher competencies, availability of curriculum materials, and cost efficiency (Grinder & Nelson, 1985). Consequently, whole classes are moved through the grade-level sequenced curriculum (also referred to as the *lock-step curriculum*) at much the same pace and usually using the *same methods and materials for the whole class* (Good & Brophy, 1987; Goodlad, 1984). Also common is the *whole-class instructional method*, in which the teacher starts a lesson by reviewing prerequisite material, introduces the new skill or concept, guides the class through a practice activity, and then assigns seatwork or homework requiring application of the new skill or concept. Small group instruction may sometimes be used, most often in reading and occasionally in math, and the teacher may provide individualized instruction by going around to each student during seatwork. These methods for organizing curriculum and instruction have become so well established in American public schools that together they form the traditional model of classroom teaching. In spite of criticism of this traditional approach to classroom teaching, its use has persisted. (Cuban, 1984; Good & Brophy, 1987; Goodlad, 1984; Grinder & Nelson, 1985).

When attempting to provide appropriate instruction for gifted and talented students, the recognized strength of the traditional model of classroom teaching becomes a weakness. The traditional model has endured mainly because "the approach seems to work reasonably well for students whose rates of learning and responses to commonly used instructional materials and methods are similar to those of the mythical 'average student' for their grade levels" (Good & Brophy, p. 353). And what about the gifted students in these classroom settings? The major shortcoming of the traditional approach to classroom teaching, and the one most pertinent to this study, is that gifted and talented

students who master the curriculum more quickly should receive accelerated pacing or enrichment (Wang & Walberg, 1985).

Needs of Gifted Students for Differentiated Educational Experiences

In 1971 the United States Congress commissioned The Marland Report, a national study on the education of the gifted. The following statement was included in that report:

> Large scale studies indicate that gifted and talented children are, in fact, disadvantaged and handicapped in the usual school situation. Terman observed that the gifted are the most retarded group in the schools when mental age and chronological age are compared. Great discrepancies existed during his study (1904), and continue to persist today....(p. 26)

Educators have long argued that a student's educational program should be determined by his or her needs, abilities and interests (Gallagher, 1985; Maker, 1982; Parke, 1989; Passow, 1982; Renzulli, 1977; Ward, 1980) and that any single educational experience will not benefit all students equally (Parke, 1989; Stewart, 1982).

In accordance with this theory, if all students in a classroom are reading in the same textbook, working the same skillsheets (even at an individualized pace), doing the same math problems or developing the same product, the educational needs of some students are not being met (Parke, 1989; Renzulli, 1977; Renzulli, Smith, & Reis, 1982). Such a situation is indefensible, whether the unmet needs are those of the high ability students or students in need of remediation. Passow (1982) states that appropriately differentiated curriculum is *essential* for gifted and talented students if they are to develop their unique gifts and talents. Conventional wisdom tells us that any student whose educational needs fall outside the range of what is provided by the regular curriculum deserves curricular modifications in order to meet his or her special needs.

The principle of readiness for learning, which is based on individual developmental patterns and needs, should govern curricular adaptations for gifted and talented students, as it should for all learners (Passow, 1982). Practitioners are careful to document a child's readiness for the basic curriculum, but are often slow to adapt the curricular pace when the basic curriculum is out-of-step with the advanced needs of the gifted learner. As Stewart states, "The very nature of programming for the gifted and talented is the art of making exceptions. . . in the pace of work . . . in the content . . . in the manner of learning and the amount of time for completing tasks. . . even in where learning takes place (1982, p. 27).

A school may not have a designated program for the gifted and talented, and therefore no students officially identified as such, yet every classroom teacher probably has students who could benefit from modification of the standard curriculum because of the advanced abilities they possess. Advanced or special abilities may be situationally specific or relative to the environment. If a student's abilities in a particular area

transcend those of the other students in the class, modification of the curriculum may be required to ensure the appropriateness of the educational experience for the high ability student (Parke, 1989).

Methods for Curricular and Instructional Differentiation in the Classroom

Several methods for differentiation can be used effectively in the regular classroom, whether or not a formal gifted program exists in the school. Though these methods are listed as discrete approaches to in-class differentiation, in actual practice they are interwoven and work most effectively when combined to provide differentiation in curricular content, process, and products.

Grouping

The results of several research studies suggest that grouping according to ability or interest, in-class or across classes, is beneficial in meeting the academic needs of gifted students (Begle, 1975; Gamoran, 1990; Keating, 1976; Kulik & Kulik, 1982; Rogers, 1991). Slavin (1987) cited positive effects of in-class ability grouping in order to carry out instruction in key content areas, such as math and reading at the elementary level. Parke (1989) identifies five grouping patterns to be used singly or in combination in classrooms with gifted students, namely, interest groups, cluster groups, multiaged classes, grade skipping and telescoping.

Self-selected Independent Study

Advocates of appropriate education for gifted and talented learners believe self-directed independent study is a primary method for providing curricular differentiation. Through this strategy, gifted students are provided with the freedom to select and study in-depth topics of interest to them. The role of the teacher is to provide students with skills for conducting systematic, independent study (Davis & Rimm, 1985; Renzulli, 1977; Renzulli & Reis, 1986). Several gifted education leaders have developed and provided empirical support for models that give students the skills necessary for self-directed independent study (Betts, 1986; Renzulli & Reis, 1986; Treffinger, 1986). Davis and Rimm (1985) state that independent study is a common "mainstreaming approach" for providing enrichment within the regular classroom.

Acceleration

Convincing arguments have also been made for the appropriate use of instructional acceleration as a method of curricular modification. Decreasing the time spent on routine activities creates opportunities for exposure to more advanced learning experiences, such as methods of inquiry or involvement with above grade level content (Passow, 1982; Phenix, 1964; Renzulli, Smith, & Reis, 1982). In other words, when curricular goals and objectives of proficiency in a skill have been achieved and documented, the student should no longer be kept in that particular learning "loop", especially if only for the efficiency of classroom management. Rogers (1991), in an analysis of thirteen research syntheses on grouping practices for the education of the

gifted and talented learner, concluded that nongraded classrooms, curriculum compaction, grade telescoping, and subject acceleration practices produce significant academic gains for these students. She stated, "Students who are gifted and talented should be given experiences involving a variety of appropriate acceleration-based options, which may be offered to gifted students as a group or on an individual basis" (p. 28).

Higher Cognitive Processes

Gifted students not only have the ability to comprehend at a greater depth and complexity than other students, they have a need to be given that opportunity (Parke, 1989; Passow, 1982; Rogers, 1986). Throughout the literature on curricular modification for high ability students, one of the most frequent recommendations is added emphasis on higher levels of thinking, such as Bloom's application, analysis, synthesis, and evaluation levels (1956). In describing the types of activities observed in the teaching of social studies and science, Goodlad (1983) expressed grave concern about the curriculum which appeared to be composed of topics to be acquired but not explored. He observed very little activity which involved any mental processes beyond acquisition and recall of information. Whitehead (1929) refers to knowledge that is not utilized as "inert ideas."

Questioning Strategies

One method for facilitating both deeper and broader involvement with content is through skillful questioning. The teacher's role as initiator and determiner of the kinds of thought processes expressed in the classroom is central and crucial (Gallagher, Aschner, & Jenne, 1967). Instructors' questions are the major vehicle for emphasizing more complex levels of thinking (Taba, 1966). While research findings on the relationship between cognitive questioning and student achievement are conflicting, Gall (1984) concluded in his synthesis of research on teacher questioning that emphasis on higher cognitive questions has a positive effect for students of average and above average ability.

Although research studies indicate inconsistent findings about the degree to which the cognitive level of teachers' questions corresponds to the cognitive level of students' responses, due in large part to the variety of sampling techniques used within them, several researchers have found a moderate to strong, positive correspondence (Arnold, Atwood, & Rogers, 1973; Gallagher & Aschner, 1963; Mills, Rice, Berliner, & Rosseau, 1980). Maker (1982) stresses the importance of the teacher's questioning strategies:

> When it comes to mental activity, teachers get what they ask for. If they ask a low-level question, they get a low-level answer, and if they ask a question calling for a high-level analysis, that is what they get. (p. 35-36)

Through skillful questioning, the teacher is actually modeling critical thinking, as opposed to acceptance of information without examination (Maker, 1982), and is modeling a vital mode of information-gathering to be used by students long after they have left school.

Wait Time

The complexity of questions and the expected responses involves the issue of "wait time" (Rowe, 1974, 1986; Tobin, 1980, 1987; Tobin & Capie, 1982). If a classroom goal is higher level questions followed by higher level responses, then wait time appears to be a necessary ingredient. Students may need more time just to process complex questions, and the resulting formulation of original responses takes more time (Good & Brophy, 1987). "When the purpose of classroom discourse is to stimulate higher cognitive processes, teachers should utilize an average wait time of 3-5 seconds" (Tobin, 1987, p. 91). Rowe (1974) found that longer wait times lead to more active class participation by a larger percentage of the students, as well as an increase in the quality of this participation. Rowe's research has been verified by subsequent research (Swift, Gooding, & Swift, 1988; Tobin, 1983a, 1983b). Pre-response wait time refers to the pause after a question has been asked but before it is answered or before anyone is called upon to answer it. This elapsed silent time is necessary to allow students to consider the question and the content involved and to develop an original response. Post-response wait time refers to the pause after an answer has been given but before a verbal judgment or comment has been made about that answer. This allows time for students to elaborate and to furnish relevant evidence in support of the answer given. Both types of wait time are important in relation to students' thinking (Hunkins, 1989).

Of course, providing students with practice in the higher mental processes through questioning and wait time are sound teaching methods; students of all ability levels may benefit. The same can be said about challenging students to push beyond the boundaries of what they can easily achieve. This does not negate the importance of providing these instructional practices for high ability students "for it is the response of the child to the content that makes it appropriate rather than anything inherent in the content itself" (Robinson, 1986).

The intent of this observation study was to examine the existence and degree to which the above methods for providing instructional differentiation in the classroom were used with gifted and talented students. The procedures used to gather these data are described in the next chapter.

CHAPTER 3: Procedures

This section provides information about the methods and procedures followed in the study. The sampling techniques, the research design, the procedures used to develop the instrument and collect data, and the procedures used for data analyses are all described.

Sampling Procedures

Purposive sampling was used in this study. Collaborative School Districts of The National Research Center on the Gifted and Talented, NRC/GT, and other districts in locations accessible to the observers were contacted as potential observation sites. Efforts were made to include school districts located in the four regions of the United States defined by the U.S. Census Bureau (i.e., Northeast, South, North Central, and West) and districts located in suburban, rural, and urban communities.

Telephone calls were made to the NRC/GT Collaborative School District "contact persons" or the Superintendents of non-Collaborative School Districts to explain the study and request permission for an observer to spend two days visiting a third or fourth grade classroom. Following the telephone conversation, letters describing the study were mailed to the district (see Appendix A). In most situations, the letter was sent to a central office administrator who discussed the study with an elementary principal who, in turn, asked classroom teachers to volunteer their classrooms as potential observation sites. In some cases, teachers were asked directly by the school principal if they were willing to permit an observer to spend two days in their classroom. The use of volunteers may affect the generalizability of the findings; however, the procedure was necessary to obtain entry to classrooms. This issue was addressed by Ryans (1960): "Obviously the educational system in this country does not permit the use of a random sampling design or even a modification thereof for which adjustments for systematic error may be made with any great assurance. The cooperation of a school system, a school, or a teacher in a research project must remain voluntary in any decentralized system of education" (p. 58).

Telephone calls requesting permission to observe in a classroom were made to 71 school districts throughout the country. Fifty of these agreed to allow an observer to spend two days in a third or fourth grade classroom. Ultimately, 46 of these districts participated. Shortly before observations were to be conducted in some schools, unexpected circumstances resulted in cancellations; namely, the death of a teacher's parent, an observer's car broke down on the way to the observation and the teacher was unwilling to reschedule, and a teacher changed her mind about permitting an observer to spend two days in her room.

Observation Sites

The observation sites, including their region, community type, grade level, and existence of a gifted program, are shown in Table 1. The number of school districts within each region were 11 in the South, 9 in the West, 8 in the North Central, and 18 in the Northeast. Districts identified themselves as suburban, urban, and rural on district profile sheets completed by an administrator within the district. Twenty-two districts were suburban, 11 were urban, and 13 were rural. Forty-three sites were public schools; the other three were private schools, one suburban, one rural, and one urban. The observations were split equally between third and fourth grade classrooms. The sample included 26 schools that had formal gifted programs in place (referred to as program schools, hereafter) and 20 schools with no formal gifted programs (referred to as no-program schools, hereafter).

To support the representativeness of the sample program schools, schools were chosen only if they used standardized achievement test scores among their selection criteria for gifted programs. As reported by the Council of State Directors of Programs for the Gifted (1987), all states require or recommend the use of standardized achievement test scores and teacher recommendations for the identification of gifted students. To participate in this study, the program schools met the following criteria: (1) schools had to have heterogeneous classrooms with students identified as gifted, (2) gifted programs must have been operational in schools at the grade level of the observed classrooms (third or fourth), (3) gifted programs employed the services of gifted education resource teachers, (4) teachers in the observed classrooms had to be willing to permit the use of audio-cassette tape recorders during the observations, and (5) schools had to be willing to release standardized achievement test data for students in the observation classrooms. The no-program schools met the following criteria: (1) schools had to have heterogeneously grouped classrooms, (2) no special programming for gifted students existed in the school at the grade level for which observations were made, (3) teachers in the observed classrooms had to be willing to permit the use of an audio-cassette tape recorders during the observations, and (5) schools had to be willing to release standardized achievement test data for students in observation classrooms. The initial letter sent to districts provided assurances of confidentiality for students, teachers and school districts participating in this study.

Target Students

One objective of the study was to make a direct comparison between the curriculum and instruction provided for gifted students in the regular classroom and the curriculum and instruction provided for average students in the same classroom. To make this comparison, two students, one gifted and talented and one average ability, were selected as target students for each observation day. In the no-program schools, students were not formally identified as gifted and talented; therefore, instead of selecting a target gifted student (a formally identified student), a target "high ability" student was selected. To ensure that the high ability students observed in the no-program schools were comparable to the gifted students in the program schools, achievement test data were gathered for all classrooms observed.

Table 1

Observation Sites

State	Region	Community	Grade	G/T Program
AL	South	Urban	4	yes
CA	West	Rural	4	yes
CA	West	Suburban	3	no
CA	West	Urban	4	yes
CA	West	Suburban	4	yes
CO	West	Suburban	4	yes
CO	West	Suburban	4	yes
CO	West	Rural	4	no
CO	West	Suburban	4	no
CT	Northeast	Rural	4	no
CT	Northeast	Urban	3	no
CT	Northeast	Suburban	4	yes
CT	Northeast	Suburban	3	no
CT	Northeast	Urban	3	yes
CT	Northeast	Suburban	3	yes
CT	Northeast	Urban	4	yes
CT	Northeast	Urban-Private	3	no
IA	North Central	Urban	4	yes
IN	North Central	Urban	4	yes
IN	North Central	Suburban	3	yes
IN	North Central	Rural	3	no
KY	South	Suburban	3	no
KY	South	Suburban-Private	4	no
KY	South	Suburban	3	yes
MA	Northeast	Suburban	4	yes
MA	Northeast	Suburban	3	no
MN	North Central	Rural	3	yes
MN	North Central	Rural	3	no
MN	North Central	Urban	4	yes
MS	South	Suburban	3	no
NJ	Northeast	Suburban	4	yes
NJ	Northeast	Suburban	3	yes
NM	West	Rural	4	yes
OH	North Central	Urban	3	no
RI	Northeast	Suburban	3	no
RI	Northeast	Suburban	4	yes
RI	Northeast	Suburban	3	no
TX	South	Urban	3	yes
VA	South	Rural	3	yes
VA	South	Rural	3	yes
VA	South	Suburban	4	yes
VA	South	Rural-Private	4	no
VA	South	Suburban	4	yes
VT	Northeast	Rural	3	no
VT	Northeast	Rural	3	no
VT	Northeast	Rural	3	no

A trained observer spent two days recording information on target students in each classroom. Two students from each classroom were selected for each day of observation. In view of the types of behaviors being observed and coded, especially those that relate to verbal interactions, the observation of additional students within a given class would have been prohibitive. The total number of classrooms was 46 with two observations in each classroom, resulting in observations of 92 target gifted and 92 target average students.

The target students in the program schools, one identified gifted student (Target Student #1) and one average student (Target Student #2), were selected systematically each day from student rosters (See Roster in Appendix A). The rosters were completed by classroom teachers and provided to the observers before the observations occurred. Systematic procedures for the selection of target students were designed to ensure the inclusion of minority students and economically disadvantaged students. Free or reduced lunch was used as an indicator of economically disadvantaged students because this program is based on family income and number of dependent children in the household. In the schools with formal gifted programs, observers defined a "target gifted student" by selecting one of the students identified by the district as gifted on the student roster. While the formal identification procedures differed within local districts, they all used student achievement and teacher rating information. In the schools with no formal gifted programs, observers selected one of the students who had a composite score at or above the 90th percentile on a standardized achievement test or a teacher ability rating of a 4 (high ability) or a 5 (superior ability) on the student roster. A decision was made that if a particular teacher didn't give any student a rating of "4" or "5" and no student met the achievement test criterion, observations would not take place in that classroom. A replacement classroom would be found instead, preferably in the same school or district. The "target average students" selected in the classrooms were students who received teacher ability ratings of a 3 on the student roster. These procedures yielded a sample with median standardized achievement test composite scores (using national norms) at the 96th percentile for the target gifted/high ability students and at the 65th percentile for the target average students.

The observers selected the target students before the students entered the classroom, and they identified where the target students were sitting from the seating chart provided by the classroom teacher. When possible, the observer selected two students of the same ethnicity, gender, and free or reduced lunch status. All of this information and students' first names were included on the student roster. Each observer was instructed to select minority or economically disadvantaged students when possible and to vary gender as evenly as possible among his or her total number of observations. Observers were provided with a protocol and flow chart in the training manual for the selection of target students (see Appendix A). The resulting sample of target students is described in Table 2.

Table 2

Profile of Target Students

	Gifted & Talented/High Ability	Average Ability
Gender		
Male	39	35
Female	53	57
Limited English Proficient	1	2
Handicapped	0	1
Economically Disadvantaged	18	22
Ethnicity		
African-American	10	8
Asian-American/Pacific Islander	9	0
Hispanic-American	2	8
Native-American	1	1
Caucasian-American	69	75
Other	1	0

Research Design

Naturalistic observation, also called nonparticipant observation, was the research method used in this study. This methodology involves observations of students in their classrooms without attempt to control or manipulate variables. Several procedures were used to ensure that the observations would be as unobtrusive as possible and to reduce potential reactive effects. First, a decision was made to spend two days in each classroom, rather than one day, to reduce the effect due to the presence of an observer in the classroom. Classroom teachers were asked to continue with their regular teaching schedule on the observation days. In other words, they were told to avoid doing extraordinary lessons intended to impress the observer. Additionally, all classroom teachers were given a standard script to use when introducing the observer to the students (see Appendix A). Observers were instructed to sit in a location where the students would not see the observer or be reminded of the observer's presence in the classroom.

Research Questions

Two general research questions, listed in Chapter One of this report, formed the basis for this study. Several specific research questions were developed to guide the data collection and analyses.

The research questions that guided this study to be addressed with descriptive statistics included:

1. What are the types of instructional activities experienced by the gifted students in the academic subject areas (reading, language arts, mathematics, social studies, and science)?

2. What are the size and the composition of the groups in which gifted students are involved during instruction in the academic subjects?

3. What are the types of differentiated experiences provided for gifted students in the academic subjects?

The research questions that guided this study to be addressed through chi-square analyses included:

4. Is there a significant difference in the types of teacher questions addressed to gifted and average students across all sites?

5. Is there a significant difference in the types of questions addressed to gifted and average students in program and in no-program schools?

6. Is there a significant difference in the wait times provided by teachers to gifted and average students across all sites?

7. Is there a significant difference in the wait times provided by teachers to gifted and average students in program and in no-program schools?

8. Is there a significant difference in the total verbal interactions involving gifted and average students in program and in no-program schools?

9. Is there a significant difference in the number of knowledge/comprehension and higher-order questions asked of any student or to the class in program and no-program schools?

10. Is there a significant difference in the number of questions with and without wait times in program and no-program schools?

Instrument Development

An observational instrument, the Classroom Practices Record (CPR), was designed to document the extent to which gifted and talented or high ability students receive differentiated instruction through modifications in the curricular activities and materials and through verbal interactions with teachers (Westberg, Dobyns, & Archambault, 1990). This instrument, included in Appendix A, was developed by adapting the Classroom Observation Instrument (Giesen & Sirotnik, 1979) used by Goodlad (1984) in his "Study of Schooling in the United States" and the Classroom Activity Record developed by Evertson and Burry (1989). Four separate pilot administrations of the Classroom Practices Record were conducted for the purpose of making revisions in the instrument, the training manual, and the observation procedures. The staff members involved in the third and fourth field trials met after each field trial to discuss the observation experiences and provide suggestions for revisions to the CPR instrument.

The Classroom Practices Record (CPR)

The Classroom Practices Record (CPR) contains six sections: Identification Information, Physical Environment Inventory, Curricular Activities, Verbal Interactions, Teacher Interview Record, and Daily Summary (See CPR in Appendix A). The first two sections are found on page one of the CPR. The first section, Identification Information, provides a record of the school, the teacher, and target students observed. The CPR was designed to provide descriptive information on two students, not the entire class; therefore, Target Student #1 refers to an identified gifted and talented student or high ability student and Target Student #2 refers to an average ability student. The second section, Physical Environment Inventory, records the availability and types of learning/interest centers, the seating pattern, and the location of the two target students in the classroom.

The third section, Curricular Activities, found on page 2 of the CPR provides a record of fourteen types of curricular activities that are used by teachers in academic subject areas. Grouping practices and evidence of curricular differentiation experienced by Target Student #1, the target gifted or superior ability student, are also recorded in this section.

The fourth section, Verbal Interactions, on page 3 of the CPR is used in conjunction with the Curricular Activities section and is completed whenever a verbal interaction transpires between the teacher and students (or vice versa). Codes are used to record who is involved in the verbal interaction, the type of interaction, and the existence of 3 or more seconds of wait time associated with questions.

The last two sections found on pages 4 and 5 of the CPR are open-ended. The fifth section, Teacher Interview Schedule, is semi-structured and contains topics that the observer discusses with the classroom teacher to clarify or elaborate on information recorded in the Curricular Activities section. The sixth section, Daily Summary, provides

a summary record of the differentiation observed in the classroom during each observation day.

Observers

The individuals who were selected to conduct the observations were NRC/GT staff members, NRC/GT Consultant Bank members, and a free-lance educational consultant. A list of the seventeen observers is found in Appendix B. All observers had classroom teaching experience, training in gifted education, and training in educational research methodology. Almost all observers have doctoral degrees or are doctoral candidates in gifted education.

Observer Training Procedures

CPR training was provided through a manual (Westberg, Dobyns, & Archambault, 1992) that outlined the procedures to be used (Training Manual is found in Appendix A). Observers read the manual, completed a series of home training exercises, and discussed questions with the principal investigators about the coding procedures. Then, they completed a written training exercise to establish the reliability of their codings (Training Exercise is found in Appendix C).

The training exercise was a simulation of current events instruction in a social studies class. The training exercise included a student roster, a description of the social studies activities, and the dialogue between teacher and students. The information provided in the training exercise was used to code the Identification Information, Curricular Activities, and Verbal Interaction sections of the Classroom Practices Record. Before distributing the training exercise to observers, the principal investigators completed the exercise individually, and then, discussed their codings with each other to confirm their agreement on the codings.

Reliability Procedure for Training Exercise

A criterion-related agreement procedure was selected to provide an estimate of the reliability of the observers' codings on the training exercise. A criterion-related agreement procedure determines the percent agreement between an observer's recordings and the principal investigators' codings, the standard criterion recordings (Sattler, 1988). Frick and Semmel (1978) believe criterion-related agreement is more useful than interobserver agreement when establishing the adequacy of individual observer skills.

The standard criterion recordings from the training exercise were grouped into four event categories: identification information on target students, curricular activities, knowledge/comprehension and higher order questions, and other verbal interactions. The total points for each of these categories were 7, 17, 7, and 5, respectively. Observers' percent agreement for each category and the total points on the exercise are listed in Table 3. As indicated in the table, all observers demonstrated at least 80% criterion-related agreement on the four event categories and the total training exercise. Because the observers demonstrated acceptable levels of criterion-related agreement, the training

for the classroom practices observation study was considered to be satisfactory, and the observers were permitted to conduct the actual classroom observations.

Table 3

Criterion-Related Percent Agreement Procedure on the Training Exercise

Observer	Event 1	Event 2	Event 3	Event 4	Total Events
1	100	94	86	80	92
2	100	100	100	100	100
3	86	100	86	80	92
4	86	88	100	100	92
5	86	94	100	100	94
6	100	88	86	100	92
7	100	94	86	100	94
8	100	100	86	80	94
9	86	100	86	80	92
10	100	94	86	100	94
11	100	94	86	100	94
12	86	94	86	100	92
13	100	88	86	100	92
14	100	100	86	100	97
15	86	88	100	100	92

Data Collection

Nonparticipant observation and semi-structured interviews were selected as the data-gathering techniques for this study. It was the intent of this study to intrude as little as possible in the regular happenings of the classroom (Borg & Gall, 1989). Procedures for data gathering were systematically outlined in the observer's training manual (Westberg, Dobyns, & Archambault, 1990). When conducting the observations, the observers used the CPR instrument and tape recorders. Semi-structured interviews were also conducted with classroom teachers at the end of the observation days. Semi-structured interview procedures were used to gather comparable data across sites and still allow enough flexibility for the observer to note and collect data on unexpected dimensions of the study (Bogdan & Biklen, 1982). Observations were conducted in the spring, two-four months before the end of the academic year.

Data Analysis

The data that were coded and collected from the 92 observation days included information on curricular differentiation and verbal interactions between teachers and students. Codes on the CPR instrument were used to record the types of instructional activities, the size of the groups, the composition of the groups, and the length and types of differentiation experienced by the target gifted and talented or high ability student during reading, language arts, mathematics, social studies, and science classes. Codes were also used to record the following types of interactions: knowledge-comprehension question, higher-order question, and explanation or comment and the verbal interactions between or among the teaching adult, Target Student #1, Target Student #2, non-target students, and students-at-large. Wait time, the length of elapsed time after a question, was also recorded. For this study, pre-response time of three seconds or more was recorded.

The following data analysis procedures were selected to address the research questions in this study. First, the reliability of the codings made during the actual observations was examined by listening to five minute segments of an audio-tape returned by each observer. Second, descriptive statistics were computed to respond to the first three research questions for the study. Chi-square procedures were used to analyze the data for the remaining seven research questions. Crosstabulation procedures through SPSS-X (SPSS, 1988) were selected to produce contingency tables and chi-square statistics. And finally, a content analysis procedure was used to synthesize the open-ended information from the daily summary sections of the CPR. The results from all data analysis procedures are explained in the next chapter.

CHAPTER 4: Results

This chapter summarizes the results from observations conducted on 92 days in 46 third and fourth grade classrooms. First, the methods for examining the reliability of the observers' recordings are explained. Second, procedures for data cleansing and data coding are described. Third, the quantitative findings from the descriptive and chi-square procedures conducted to answer the ten research questions are presented. Fourth, the results from the content analysis of information recorded in the observers' daily summaries are described. And finally, additional analyses conducted to examine the quantitative findings are presented.

Reliability of the Verbal Interaction Data

As described in the previous chapter, a criterion-related procedure was used with the training exercises to establish the reliability of the Classroom Practices Record. As an additional safeguard on the quality of the data, the reliability of observers' verbal interaction codings was also established by having one of the principal investigators listen to a five minute sample of at least one audiotape per observer and comparing the principal investigator's ratings with each observer's codings. The criterion of 80 percent agreement was selected to provide satisfactory evidence of the accuracy of observers' recordings of knowledge/comprehension and higher order thinking skill questions.

One of the principal investigators listened to a minimum of five minutes of verbal interactions between teachers and students and coded the interactions. These codings were then compared to the observer's codings of the same verbal interactions. The percent agreement between the two codings was based on the classification of questions as either knowledge/comprehension (KC) or higher order thinking skills (HOTS). In the case of two observers, audiotapes were completely inaudible, and therefore, this procedure for establishing agreement could not be employed. However, one of these observers wrote down the questions verbatim in the Miscellaneous Notes column of the Verbal Interaction page, and the researcher's interpretation of the level of these questions was in complete agreement with the observer's interpretation and coding. Sample audio checks of all other observers' codings on question types resulted in observer agreement which met or exceeded the .80 criterion.

Data Screening and Coding

Extensive data preparation, screening and cleansing procedures were used with the observation data. First, a computer codebook, which included eleven records of information for each observation day, was developed to organize the data before it was entered on computer coding sheets and into the data file (see Codebook in Appendix D). After data were entered in the file, SPSS-X Frequencies procedures (SPSS, 1988) were used to screen for minimum and maximum values and missing data. Inconsistent scores

were verified or corrected by comparing these to the computer coding sheets and original data.

Student responses to teacher questions were sometimes followed by nonverbal or inaudible teacher reactions; therefore, it was impossible to examine systematically the reliability of each observer's wait time codings from the audiotapes. Thus, wait times were investigated through a frequencies procedure. The means for each of the seventeen observers' wait time codings across all observation days and questions were calculated and found to range from 1 to 22. The mean frequency of all seventeen observers' wait time codings was 4.24 with a standard deviation of 5.87. Two extreme wait time means were found, namely, values of 16 and 22. While it was impossible to determine the accuracy of the wait time codings on the audiotapes returned by these observers, attempts were made to further investigate this by listening to the audible portions of their tapes. This examination revealed that one observer recorded wait times for questions that were actually less than three seconds, and therefore, should not have been coded as such. Because this observer accurately coded knowledge/comprehension and higher order thinking skill questions, a decision was made to keep this person's observation data, but eliminate this person's wait time codings from all wait time analyses.

Descriptive Statistical Results

Descriptive statistical procedures were used to compute the frequencies of all variables and to address research questions #1, #2, and #3 which addressed the types of instructional activities, grouping arrangements, and types of differentiation experienced by target gifted students. The following procedure was used to compute the descriptive statistics. The types of instructional activities and the size and composition of the groups were measured in minutes, therefore, the percentages reported for these variables reflect time. The percentages reported for the six types of differentiation experiences, however, reflect the number of activities in which the target gifted students experienced each type of differentiation.

Research Question 1: Types of Instructional Activities

The first research question addressed the types of instructional activities involving the target gifted and talented or high ability students during instruction in reading, language arts, mathematics, science, and social studies. Fourteen types of activities were coded during the observations. Table 4 presents the percentage of time spent by students in the various types of instructional activities in the five subject areas. The two most frequently observed activities within each subject area are of particular interest. During reading instruction, the target gifted and talented or high ability students observed on the 92 days were involved in written assignments and oral reading activities for 21% and 15% of the time, respectively. During language arts instruction, they were most frequently involved in activities employing written assignments for 27% of the time and review/recitation for 13% of the time. During mathematics instruction, the target gifted students spent 36% of the mathematics instructional time on written assignments and 17% of the time each in activities involving explain/lecture and review/recitation. During

science instruction, these students spent 20% of the time in explanation/lecture activities and 19% of the time in review/recitation. In social studies, they spent 18% of the time on written assignments and 17% of the time in explain/lecture. Across all five subject areas, the target gifted and talented or high ability students were most frequently involved in written assignment (26%), review/recitation (13%), and explain/lecture (12%) activities.

Table 4

Mean Percent of Time Spent in Various Instructional Activities by Gifted Students

	Reading	Language	Math	Science	Social Studies	All Subj.
Activity No.						
1. audio visual	0	4	0	6	2	2
2. demonstration	2	2	4	3	4	3
3. discussion	14	7	4	9	13	9
4. explain/lecture	7	8	17	20	17	12
5. games	1	3	9	1	1	3
6. non-academic	2	3	2	2	2	2
7. oral reading	15	10	1	7	13	9
8. project work	5	5	4	2	11	5
9. review/recitation	12	13	17	19	7	13
10. silent reading	13	6	0	3	1	5
11. simulation/role playing	3	0	0	9	2	2
12. testing	1	6	5	2	2	4
13. verbal performance	4	6	2	1	6	4
14. written assignments	21	27	36	17	18	26

Note: Percents are rounded.

Research Question 2: Grouping Practices

The second research question addressed the size and the composition of the instructional groups in which the target gifted students were involved. The mean percent of time spent by the target gifted students in groups of varying size during instruction in the five academic subject areas on the 92 observation days is listed in Table 5 below. For the majority of the time within each subject area, students participated with the entire class. They worked individually for only 12% of the time across the five subject areas and in small groups (2-6 students) only 13% of the time. In addition to recording the size of the groups, observers recorded the composition of the groups, homogeneous grouping or heterogeneous grouping, in which target gifted students worked during instruction in the five subject areas. The percentage of time spent by students in these two types of groups within each subject area is also shown in Table 5. Target gifted and talented or high ability students were homogeneously grouped according to achievement or ability level for 40 percent of the time in mathematics and for 29 percent of the time in reading. Across all five subject areas, students received instruction in homogeneous groups for a mean of only 21 percent of the time.

Table 5

Mean Percent of Time Gifted Students Spent in Groups During Instruction in Academic Subjects

Group Size	Reading	Language	Math	Science	Social Studies	All Subj.
Individual	14	14	10	7	8	12
2-6 Students	15	9	18	9	13	13
7 or more Students	19	9	5	3	1	8
Total Class	52	68	66	81	79	67
Group Composition	**Reading**	**Language**	**Math**	**Science**	**Social Studies**	**All Subj.**
Heterogeneous	71	83	61	95	99	79
Homogeneous	29	17	40	5	2	21

Note: Percents are rounded.

Research Question 3: Differentiation Experiences

Research question 3 investigated the types and duration of differentiated experiences provided to the target gifted and talented or high ability students in the five academic areas. The percentage of activities with differentiated experiences for gifted students is shown in Table 6. Across all five subject areas and all activities within these subjects on the 92 observation days, no instructional or curricular differentiation was found in 84% of the activities experienced by the target gifted or high ability students. It should be noted that instruction in reading or mathematics groups was not considered differentiated if the higher level groups were working with the same content or doing the same activities as the lower groups. Interviews with teachers were conducted to determine what was occurring within the different groups. For example, if three fourth grade teachers grouped within their grade level for reading instruction, and they were using the same materials or books or working on the same concepts and skills (either at the same time or close to the same time) within these groups, it would have been coded as "no differentiation." However, if the top group was using reading materials normally used at the next grade level, it would have been coded as "advanced content instruction." Another example of differentiation is as follows: if the top reading group used the same basal reading series as the other groups, but covered the material in the basal text during one semester and spent the next semester reading advanced level novels, it would have been coded as "advanced content" differentiation.

As indicated on Table 6, students were involved in advanced content instruction for five percent of the activities across all five subject areas. Observers' notes about this type of differentiation indicated that the top students in some classes were placed in a reading or math group that used an above grade-level textbook.

Across all five subjects, five percent of the activities experienced by the target gifted and talented or high ability students contained "other" types of differentiation experiences. Observers' notes indicated that some of these "other" indicators of differentiation included activities such as special grouping practices used in the classroom and expectations for gifted students to complete basic mathematics fact tests with total accuracy in less time than done by other students.

The degree to which target gifted students received differentiated experiences was examined further by comparing these practices in schools that did and did not have formal gifted programs. In classrooms with formal gifted programs, the target gifted students received no differentiation of any sort in 84.1% of the activities; and, in schools with no gifted programs, the target gifted students received no differentiation in 84.4% of the activities, a non-significant difference.

Table 6

Percent of Activities in Which Gifted Students Received Differentiated Experiences

Type of Diff.	Reading	Language	Math	Science	Social Studies	All Subj.
No Differentiation	80	88	77	87	92	84
Advanced Content	9	3	11	2	0	5
Advanced Process	7	2	4	0	1	3
Advanced Project	1	1	0	1	3	1
Independent Study w/ Assigned Topic	1	1	0	2	3	1
Independent Study w/ Self-Selected Topic	1	2	0	0	0	1
Other Differentiation	3	4	8	8	2	5

Note: Percents are rounded.

Results of Chi-Square Analyses

Crosstabulation procedures through SPSS-X (SPSS, 1988) were used to produce contingency tables, chi-square statistics, and phi or contingency coefficients to answer research questions 4-10. The results of the analyses for each question are presented below.

Research Question 4: Questions to Target Students Across All Sites

The fourth research question investigated the difference in the number of the knowledge/ comprehension and higher order thinking skills questions (application, analysis, synthesis, and evaluation) addressed to target gifted students and target average students. The results of this analysis are shown in Table 7. While the majority of the questions addressed to both target gifted and average students were at the knowledge/ comprehension level, there was no significant difference, at the .05 alpha level, in the types of questions addressed to the two groups of target students.

Table 7

Frequencies and Percentages for Question Types To Target Students

	Target Gifted Students			Target Average Students		
	Frequency	Row Percent	Column Percent	Frequency	Row Percent	Column Percent
Knowledge/ Comprehension Questions	208	56.7	78.2	159	43.3	81.1
Higher Order Thinking Questions	58	61.1	21.8	37	38.9	18.9
Total	266			196		

The obtained X^2= .426 (1), not significant at .05 alpha level.

Note: Percents are rounded.

As shown in the above table, more questions of both types were directed to gifted students. A total of 266 questions were asked of gifted students and 196 questions were asked of average students. A one-sample chi-square test was computed on these totals, resulting in an obtained chi-square statistic of 10.61, *df*=1, significant at the p<.001 level. Thus, a significantly greater number of questions were directed at target gifted students than target average students.

Research Question 5: Questions in Program and No-Program Schools

While the results of the analysis reported in Table 7 investigated the differences between question types for target students across both program and no-program schools, the next analysis was conducted to address the difference between the types of questions raised to target students in the gifted program schools and in the no-program schools. Separate 2 x 2 contingency tables were produced for program and no-program schools to examine these differences, the results of which are shown on Table 8. At the .05 level, no significant differences in the types of questions between the two groups of target students were found in either program or in no-program schools.

Table 8

Frequencies and Percentages for Questions to Target Students in Program Schools and in No-Program Schools

G/T Program Schools:	Target Gifted Students			Target Average Students		
	Frequency	Row Percent	Column Percent	Frequency	Row Percent	Column Percent
Knowledge/ Comprehension Questions	102	65.0	77.3	55	35.0	76.4
Higher Order Thinking Questions	30	63.8	22.7	17	36.2	23.6
Total	132			72		

The obtained X^2= .02 (1), not significant at .05 alpha level.

No-Program Schools:	Target Gifted Students			Target Average Students		
	Frequency	Row Percent	Column Percent	Frequency	Row Percent	Column Percent
Knowledge/ Comprehension Questions	106	50.5	79.1	104	49.5	83.9
Higher Order Thinking Questions	28	58.3	20.9	20	41.7	16.1
Total	134			124		

The obtained X^2 = .97 (1), not significant at the .05 alpha level.

Note: Percents are rounded.

As indicated in the Table 8, a greater number of questions of both types were provided to target gifted students than target average students. One sample chi-square tests were computed on these to determine if these differences were significant. The obtained chi-square statistic for program schools was 17.647, *df*=1, significant at the .001

level; therefore, a significantly greater number of questions were directed to target gifted students in program schools. The obtained chi-square statistic for no-program schools was .388, *df*=1, not significant at the .05 level; therefore, there was not a significant difference in the total number of questions addressed to target gifted or target average students in the no-program schools.

Research Question 6: Wait Times Across All Sites

Research question 6 investigated the difference in questions with and without pre-response wait times of three seconds or more between target gifted students and target average students at all sites. For this analysis, all questions (knowledge/comprehension and higher order questions) were included in the 2 x 2 contingency table produced to analyze this research question. As described earlier, one observer's wait time codings were dropped; therefore, the frequencies below represent observations conducted on 84 observation days. The frequencies and column percentages from the analysis are shown in Table 9. First of all, the number of total questions with wait times provided is of particular interest; only 22 knowledge/comprehension or higher order questions with wait time of 3 or more seconds were addressed to either target gifted students (n=6) or target average students (n=16) on the 84 days. The obtained chi-square statistic indicates a significant association in the questions with and without wait times addressed to target students; namely, target gifted and talented students were provided with less wait time for questions than target average students. However, the phi coefficient indicates that the strength of the association between the wait time and target student variables is low.

Table 9

Frequencies and Percentages for Questions With and Without Wait Times to Target Students

	Target Gifted Students		Target Average Students	
	Frequency	Column Percent	Frequency	Column Percent
Questions With Wait Time	6	2.4	16	9.3
Questions Without Wait Time	241	97.6	156	90.7

The obtained $X^2 = 9.628$ (1), $p<.01$. The phi coefficient = .152.

Note: Percents are rounded.

Research Question 7: Wait Times in Program and No-Program Schools

Research question 7 investigated the difference in questions with pre-response wait times of three seconds or more between target gifted students and target average students separately in gifted program schools and in no-program schools. All questions (knowledge/ comprehension and higher order questions) with pre-response wait times of 3 seconds or more were included in the 2 x 2 contingency table produced to address to this question. Again, one observer's wait time codings were not included in this analysis, therefore the frequencies below represent codings made on 84 observations days. As shown in Table 10, the number of questions with wait times addressed to target students were highly infrequent, resulting in expected frequency values of less than 5 per cell. Therefore, a chi-square statistic could not be interpreted for this analysis.

Table 10

Frequencies and Percentages of Wait Time Questions to Target Students in Program Schools and in No-Program Schools

	Target Gifted Students		Target Average Students	
	Frequency	Column Percent	Frequency	Column Percent
No-Program Schools	3	50	16	100
Program Schools	3	50	0	0

Research Question 8: Total Verbal Interactions in Program and No-Program Schools

Research question 8 investigated the difference in the total verbal interactions between target students in program and in no-program schools. Total verbal interactions included all questions, explanations or statements, and requests or commands. The frequencies and rounded column percents of these verbal interactions are shown in Table 11. A significant chi-square value was obtained for this analysis, indicating that the type of school and target student variables are not independent with regard to the total verbal interactions. However, the phi coefficient was .08, indicating a weak relationship between these variables.

Table 11

Frequencies and Percentages of Verbal Interactions to Target Students in Program and in No-Program Schools

	Target Gifted Students		Target Average Students	
	Frequency	Column Percent	Frequency	Column Percent
No-Program Schools	275	52.1	207	60.1
Program Schools	253	47.9	137	39.8

The obtained X^2 was 5.516 (1), $p<.05$. The phi correlation coefficient =.08.

Note: Percents are rounded.

Research Question 9: Types of Questions in Program and in No-Program Schools

Research question 9 investigated the difference in the number of knowledge/comprehension and higher order questions asked of any student or to the total class between gifted education program and no-program schools. The results from a 2 x 2 contingency table for this analysis are shown in Table 12. While a larger percentage of knowledge/comprehension questions were asked in both types of schools, there was no significant association between the types of questions and existence of a gifted program.

Table 12

Frequencies and Percent of Question Types in Program Schools and in No-Program Schools

	Knowledge/Comprehension		Higher Order	
	Frequency	Column Percent	Frequency	Column Percent
No-Program Schools	1281	44.2	378	45.8
Program Schools	1615	55.8	447	54.2

The obtained X^2 was .66 (1), not significant at the .05 level.

Note: Percents are rounded.

Research Question 10: Wait Times in Program and No-Program Schools

Research question 10 investigated the difference in wait times associated with the two types of questions between program and no-program schools. All questions, knowledge/comprehension and higher order, were included in this analysis. As in previous analyses involving wait times, one observer's codings were eliminated for this analysis. As seen in Table 13 below, the results from the 2 x 2 contingency table for this analysis indicated a significant chi-square statistic at the .05 alpha level, indicating an association between questions with wait times and the school in which they occur. However, the phi coefficient indicates a low correlation between these two variables. A larger percentage of questions with wait time were found in gifted education program schools than in no-program schools.

Table 13

Frequencies and Percent of Questions With and Without Wait Times in Program Schools and in No-Program Schools

	Without Wait Time			With Wait Time		
	Frequency	Row Percent	Column Percent	Frequency	Row Percent	Column Percent
No-Program Schools	913	92.7	37.9	72	7.3	46.8
Program Schools	1498	94.8	62.1	82	5.2	53.2

The obtained X^2 was 4.831 (1), $p<.05$. The phi correlation coefficient = .043.

Note: Percents are rounded.

Content Analysis of Observers' Daily Summaries

The CPR included a daily summary section through which observers were given an opportunity to describe the setting, summarize any differentiation observed for the target gifted student, and describe the verbal interactions between the teacher and the target students. A content analysis of the 92 daily summaries indicated similar descriptions of certain instructional or curricular practices across observations. The results of these analyses are summarized in Table 14.

Table 14

Results of Content Analysis of Daily Summaries (N=92 Observation Days)

Identical Practices for all Students

1. Phrases including "no differentiation," "no purposeful differentiation," and "no meaningful differentiation" (n=51 daily summaries, 31 sites)

2. Phrases including "whole class instruction dominated, "same book, same stories read, same topics for student writing [for everyone]" (n=31 daily summaries, 18 sites)

3. Comments about ability grouping, but with all groups doing the same thing (n=10 daily summaries, 6 sites)

4. Comments about the entire class being involved in higher level instruction (n=6 daily summaries, 4 sites)

Grouping Practices

5. Comments about the use of homogeneous grouping as a method to facilitate differentiated curriculum (n=27 daily summaries, 17 sites)

6. Phrases including "differentiation in the form of peer tutoring" or "high ability students helping slower learners" (n=6 daily summaries, 4 sites)

Questioning Practices

7. Comments about more verbal interactions between the teacher and the target gifted students than between the teacher the target average students (n=12 daily summaries, 9 sites)

Differentiated Instructional Practices

8. Comments about the target gifted students independently pursuing information or being involved in a project (n=8 daily summaries, 6 sites)

9. Comments about target gifted students reading self-selected materials independently after they had completed class assignments (n=7 daily summaries, 6 sites)

10. Comments about the use of curriculum compacting or another method of permitting students to "test out" of material to provide time for enrichment or acceleration (n=5 daily summaries, 4 sites)

11. Comments indicating that the target gifted students experienced differentiation through advanced content or higher level processes (n=11 daily summaries, 9 sites)

As indicated on the table, several observers wrote comments about the classroom teachers' use of identical practices with all students. The two quotes below are examples of observers' remarks about these practices; the second quote suggests additionally that a gifted student was actually receiving less instructional attention from the teacher.

> There is a lot of artwork in the room, but although there were various types of animals and people, each student had drawn the same thing as all other students. (Everyone drew bunnies, or everyone drew [cowboys], etc...) Students have journals to write stories in and I saw a group of stories the students had done previously, but all must write the same story with the same title. (Observation in Grade 3)

> There was no effort to provide different materials, pacing or presentation between S#1 [target gifted student] and S#2 [target average student]. The teacher explained that she has so much to do with the average and low students that she has been unable to provide anything for the more able students. Further evidence of ignoring the more able students came from one of the students who is in the top reading group. He brought his book out to show me as I paused by his desk to look at his seatwork. He then explained that this book was for the "best group," but that this group had not met this day. He promised to read for me when they met the next day (the group did not meet that day either). (Observation in Grade 3)

While the overall impression from the summaries was that the target gifted students experienced little differentiated curriculum and instruction in these classrooms, four observers described classroom situations that were simply not conducive to differentiation. The following quotations reflect these sentiments.

> There are a number of students in this class that make survival, not differentiation, the main goal. While differentiation is a noble and necessary goal, I do not think it is probable that even the best trained proponent of curriculum modification would have the time or energy to accomplish much in this situation/classroom. The Talent Pool [gifted program] is <u>very important</u> to the bright students in this classroom. (Observation in Grade 4)

> The teacher expressed disappointment in not being able to do more for her G/T students. She felt time and non-grouping policies stood in the way of this. (Observation in Grade 4)

Several observers wrote comments in their daily summaries about the grouping practices they observed in classrooms. The quotes listed below indicate that classroom teachers' beliefs and practices regarding grouping are quite diverse.

> When asked about the school's policy on grouping, the teacher said she'd been encouraged to group by ability in math and reading and to use different texts for groups. She chooses not to do this "because I know I can teach them all at the

> same time with the same material and keep them from being bored." (Observation in Grade 3)
>
> Grouping in math seemed to be in name only. There was a very wide range of abilities and the teacher openly admitted that the class was more heterogeneously than homogeneously grouped. (Observation in Grade 3)
>
> Interestingly, they do ability grouping in math and spelling, but not in reading. (Observation in Grade 4)
>
> No instructional or curricular differentiation was observed during any subjects during the day. In social studies, groups were formed according to ability, but the four gifted students were not grouped together. (Observation in Grade 3)

One observer commented on a third grade teacher's questioning practices, specifically, the use of divergent questioning, but with expectations for convergent answers. This observer said, "I noticed in student responses that all answers had to be answers [the teacher] had in mind. When students disagreed, he still wouldn't accept answers--made them answer the way he wanted the questions to be answered." (Observation in Grade 3)

A few comments on daily summaries described unfortunate occurrences. The two quotations below are examples of these.

> Target Student #1 did not experience <u>any</u> differentiation even though she requested it once. (Observation in Grade 4)
>
> It should be noted that S#1 [target gifted student] was inattentive during all of her classes. She appeared to be sleepy, never volunteered, and was visibly unenthusiastic about all activities. No attempt was made to direct HOTS [higher order thinking skill] questions to her or to engage her in more challenging work. She never acted out in anyway. (Observation in Grade 4)

The results of the content analysis procedure on observers' daily summaries corroborated the findings from the descriptive and chi square statistical procedures. That is, a limited amount of differentiation in the instructional and curricular practices in the regular classroom for gifted and talented students was found on the 92 observation days.

Additional Analyses Addressing Community Type

After analyzing data to address the ten research questions, additional analyses were conducted to respond to new questions that emerged from the previous analyses. These questions were related to the differences in suburban, urban, and rural communities with respect to the previous findings. First, the frequency of differentiated activities between schools located in suburban, urban, and rural communities was investigated.

The number of activities across all five subject areas with no differentiation and some form of differentiation for gifted students in these communities were included in a 2 x 3 contingency table to address this question. The results of the chi-square analysis, shown in Table 15, indicate a significant association between community type and differentiation for gifted students. The contingency coefficient for this chi square procedure was .139, indicating a weak association between the two variables. The column percentages indicate that more differentiated activities were observed in suburban (21%) than rural (12.1%) and urban (9.6%) districts.

Table 15

Frequency of Differentiation Activities in Suburban, Urban, and Rural Schools

	Suburban		Urban		Rural	
	Frequency	Column Percent	Frequency	Column Percent	Frequency	Column Percent
No Differentiation	353	79.0	198	90.4	247	87.9
Differentiation	94	21.0	21	9.6	34	12.1
Total	427		219		281	

The obtained X^2 was 18.49 (2), p<.001. The contingency coefficient =.139.

Differences with regard to the composition of the instructional groups that involved target gifted students were also investigated in suburban, urban, and rural communities. As reported in Table 5 earlier, target gifted students worked in homogeneous groups for 21 percent of the time across all five subject areas. The breakdown of the time spent in each subject and across all five subjects by target gifted students in heterogeneous and homogeneous groups by community type is shown in Table 16. When examined separately by community types, the results indicate that the target gifted students in suburban communities spent 26 percent of the time in homogeneous groups across all five subject areas. Target gifted students in urban schools spent 18 percent of the time working in homogeneous groups, and those in rural schools spent 16 percent of the time in homogeneous groups. The most interesting differences, however, were found within the individual subject areas.

Table 16

Percent of Time Gifted Students Spent in Heterogeneous and Homogeneous Groups by Community Type

Group Composition	Reading	Language	Math	Science	Social Studies	All Subj.
Suburban						
Heterogeneous	72	81	42	93	98	74
Homogeneous	28	19	58	7	2	26
Urban						
Heterogeneous	81	80	72	88	100	82
Homogeneous	19	20	28	12	0	18
Rural						
Heterogeneous	73	90	83	100	100	84
Homogeneous	27	10	17	0	0	16

Note: Percents are rounded.

As shown on the above table, the greatest differences in the composition of groups occurred in the area of mathematics. Students in the suburban communities spent far more time receiving mathematics instruction in homogeneous groups than did students in urban and rural communities.

In addition to examining the composition of the groups, the size of the instructional groups in suburban, urban, and rural classrooms was investigated. As shown in Table 5 earlier, the target gifted students spent the majority of the time in each subject area receiving instruction with the total class and spent 12 percent of the time working individually across all five subject areas. The time spent by target gifted students in instructional groups of various sizes according to community type is shown in Table 17.

Table 17

Percent of Time Gifted Students Spent in Groups of Different Sizes According to Community Type

Group Size	Reading	Language	Math	Science	Social Studies	All Subjects
Suburban						
Individually	9	12	3	2	5	8
2-6 Students	14	8	18	14	10	12
7 or more Students	24	12	7	3	0	11
Total Class	54	68	72	81	85	69
Urban						
Individually	18	11	18	3	13	14
2-6 Students	10	7	9	5	17	9
7 or more Students	11	10	3	8	1	8
Total Class	63	71	70	85	68	69
Rural						
Individually	19	20	16	15	8	17
2-6 Students	24	12	27	5	12	16
7 or more Students	21	0	4	2	0	5
Total Class	36	67	52	78	79	62

Note: Percents are rounded.

As indicated on the above table, the grouping practices across all subjects by community type are quite similar, however, they differ in mathematics and reading. A 3 x 4 contingency table produced to examine the association between the size of the groups in mathematics and community type resulted in an obtained chi-square statistic of 25.36,

df= 6, significant at the .001 alpha level. The contingency coefficient for this analysis was .28, indicating a moderate association between the two variables. (The maximum contingency coefficient in a 3 x 4 contingency table is .816, not 1.00. See Hinkle, Wiersma, & Jurs, 1979, p. 350.) The standardized residuals within each cell were inspected to determine which cells contributed the most to the significant association between community type and group size in mathamtics. The greatest contributors to the significant association were the percent of time students received instruction individually in suburban districts and instruction with the total class in rural districts. In suburban districts, the target gifted students spent 3 percent of the time receiving mathematics instruction on an individual basis and 72 percent of the time receiving instruction with the entire class. In contrast to that, students in urban districts received individual instruction in mathematics for 18 percent of the time and instruction with the entire class for 70 percent of the time, while students in rural districts received individual instruction for 16 percent of the time and instruction with the entire class for 52 percent of the time.

In addition to mathematics, the percent of time students spent in various size groups for reading instruction is of interest, particularly in rural districts. When compared to suburban and urban districts, students in rural districts spend less time receiving reading instruction with the entire class. A 3 x 4 contingency table was produced to examine the association between the size of the groups in reading and community type. The obtained chi-square statistic for this analysis was 22.82, *df* = 6, significant at the .001 alpha level. The contingency coefficient for this analysis was .265, indicating a moderate association between community type and size of the groups in reading. (This coefficient is interpreted as moderate because the maximum contingency coefficient for a 3 x 4 contingency table is .816, not 1.00.) Inspection of the post hoc cell contributions (i.e., standardized residuals) indicated that the percent of reading with the total class in rural communities contributed the most to this significant association. In rural districts, students spend 36% of the time with the total class for reading instruction, and in suburban districts, students spend 54% of the time with the total class for reading instruction.

The results of the above analyses on community type indicate differences among suburban, urban, and rural districts. In suburban districts, a higher percentage of differentiated activities for gifted students were found, and more homogeneous grouping was used. However, in urban and rural districts, students were afforded more time to work individually.

CHAPTER 5: Conclusions and Implications

Despite several years of advocacy and efforts by educators to meet the needs of gifted and talented students in this country, the results of this observational study indicate that little differentiation in the instructional and curricular practices is provided to gifted and talented students in third or fourth grade classrooms. This is of particular concern because programs for gifted learners outside of the regular classroom are being eliminated in many parts of the country because of economic problems. When this occurs, the needs of gifted and talented students must be addressed in regular classrooms. Even if a gifted program exists, however, it may only provide 1-2 hours of instruction per week for identified students, making the classroom teacher's role even more essential. If appropriate content and instruction for gifted students is to provided in the regular classroom, several implications from this study should be considered. Conclusions from the study on grouping, curricular differentiation, and questioning practices and their implications are discussed below.

Grouping Practices

The target gifted students spent the majority of their time in reading, language arts, mathematics, social studies, and science engaged in whole-class instructional activities; and whether these students worked with the entire class or in groups, students were heterogeneously grouped across all subjects for 79% of the time. A few teachers indicated in interviews that they were not even allowed to use homogeneous grouping in reading and mathematics within classrooms or across classrooms within grade levels because of school district policies that prohibited this practice. The predominant use of heterogeneous grouping practices conflicts with what has been shown to be effective for gifted learners; that is, that homogeneous grouping produces academic gains for gifted students. Rogers (1991), in an extensive review of research on grouping practices, came to the following conclusion:

> It is very clear that the academic effects of a variety of long and short-term [homogeneous] grouping options for both the purposes of enrichment and acceleration are extremely beneficial for students who are academically or intellectually gifted or talented. There is no body of evidence that "the research says" otherwise! (pp. 25-26)

Kulik (1992) in another review of grouping practices concluded "Grouping programs that entail more substantial adjustment of curriculum to ability have clear positive effects on children" (p. vii).

Curricular Differentiation Practices

Of the fourteen types of instructional activities recorded during the observations, target gifted students spent the majority of their time doing written assignments and participating in review/recitation activities. In addition to spending a large portion of time in passive activities, 84% of the activities across all five subject areas in which target gifted students were involved contained no form of curricular differentiation. In other words, their written assignments and recitations were identical to those done by other students. Of the various forms of differentiation defined and recorded for the purposes of this study, the greatest amount of differentiation occurred in mathematics, with the target gifted students receiving advanced content instruction in 11% of the mathematics activities. The advanced content instruction in mathematics meant that students were working in an above-grade level textbook or were working on material that was several units ahead of their classmates. For 70% of the mathematics instructional time, students were engaged in written assignments, review/recitation, and explain/lecture activities. These practices are similar to those described by the National Research Council (1989) in *Everyone Counts: A Report to the Nation on the Future of Mathematics Education*.

> Despite daily homework, for most students and most teachers mathematics continues to be primarily a passive activity; teachers prescribe; students transcribe. Students simply do not retain for long what they learn by imitation from lectures, worksheets, or routine homework. Presentation and repetition help students do well on standardized tests and lower-order skills, but they are generally ineffective as teaching strategies for long-term learning, for higher-order thinking, and for versatile problem-solving. (p. 57)

The results of the analyses in this study on target gifted students' involvement in differentiated activities in third and fourth grade classrooms indicate that the majority of the target gifted students were not provided with instructional and curricular experiences commensurate with their abilities.

Questioning Practices

Two major conclusions can be drawn from the analyses on questioning practices in this study. First, the majority of the questions posed in the sample classrooms were at the knowledge/comprehension level, not at higher levels of thinking, as defined in Bloom's (1956) taxonomy, and second, when examining the wait time provided with questions, more questions with wait time were provided to target average students than to target gifted students. Furthermore, when examined with the existence of a gifted education program, fewer wait time questions were provided in the program schools.

While the results of the analyses on the types of thinking reflected in questions were not necessarily unexpected, it is nonetheless surprising that after emphasis in recent years on questioning strategies in staff development programs throughout the country,

teachers continue to ask questions that are predominately at the lower levels of thinking. Thus, not only do most gifted students have limited opportunities to engage in differentiated activities, they have few opportunities to respond to higher level questions or to think about topics or issues at a high cognitive level.

The results of the wait time investigations were also discouraging. Not only did all students have few opportunities to respond to higher-level questions in the classroom, but the gifted and talented students may have had less time to think about their responses than the average students in the same classroom. The differences in wait time between target gifted and target average students may be explained by more rapid responses by gifted students.

Implications for Teaching Gifted Students in the Regular Classroom

The implications that follow are intended for all who share in the responsibility for educating gifted learners in the regular classroom. The responsibility for the lack of appropriate learning experiences should not be placed solely on classroom teachers; rather, administrators, gifted education specialists, reading consultants, mathematics consultants, guidance personnel, and parents should work together toward changing the practices used with gifted students in the regular classroom. An overall implication from the study is that some alternatives or different practices should be provided in the regular classroom to meet the needs of gifted and talented students. School districts should provide staff development activities to classroom teachers to increase their awareness of the needs of gifted and talented students and, also, provide them with specific strategies for meeting students' needs. Informing teachers about what they should be doing is not sufficient or effective, they should be shown <u>how to do</u> this. For example, teachers should be provided with strategies for identifying student strengths and techniques for managing individualized instruction. Because preservice training for teachers on these topics is nonexistent or woefully inadequate in most college or university programs, comprehensive inservice training must be provided by school districts.

Specific knowledge of how to meet the needs of gifted and talented students is not enough, however, to ensure that this knowledge is put into practice. Classroom teachers should be encouraged and expected to experiment with strategies such as curriculum modification, alternative grouping, or independent study practices with gifted learners. This encouragement occurs infrequently in elementary schools throughout the country, particularly today when there appears to be an increasing movement toward anti-elitism, "teach the same thing, to all students, at the same time", and minimum competency testing.

Even if classroom teachers are provided with awareness, strategies, and encouragement to make new provisions for gifted learners in the regular classroom, the reality of teaching in regular classrooms today is that many teachers are frequently overburdened with a large number of students who have special needs or exceptionally large class sizes. Showing a classroom teacher how to make modifications in the

curriculum for bright students in the classroom will probably fall on deaf ears if that teacher has 32 students in the classroom, including several students with learning disabilities or emotional and behavioral problems. Therefore, other accommodations, such as cluster grouping (i.e., placing top students within a grade level into one group) for subjects or resource programs, should be provided to enable classroom teachers to meet the needs of bright students.

Implications for the Role of the Gifted Education Specialist

Special services provided to gifted and talented students outside of the regular classroom are often limited and range from 1-2 hours per week, and in some areas of the country, they recently have been reduced or eliminated because of financial constraints. A recent article on the front page of the *Boston Globe* entitled "Gifted Students Face Test of Indifference: Some Say the Best and Brightest Students Lose Out," reported the unfortunate consequences of this trend (Radin, 1991). The results of this observational study indicated that even when a gifted program existed in a school, the classroom teacher did not provide differentiated experiences for gifted learners in the regular classroom. Therefore, because of these results and the reality that most gifted students spend the majority of their time in the regular classroom, the roles of the gifted education specialist or other staff development personnel may need to be modified to include providing assistance to classroom teachers for meeting the needs of gifted students in regular classroom settings. A collaborative or consultant role for the gifted educational specialist suggests additional implications for university gifted education programs that provide training for practicing and future gifted education specialists. For example, training on peer consultation practices should be included in the educational program for these teachers.

Finally, all observers relayed personally to the principal investigators their dismay, discouragement, and in some cases, anger about the overall lack of differentiation in the instructional practices they observed being provided to gifted and talented students in the regular classroom. When they observed the eagerness displayed by the target gifted students as they left their classrooms to participate in a resource room, it was clear that the resource gifted programs provided some enrichment, challenge, or excitement for these students. Their reactions were similar to Lutz and Lutz's (1980) conclusion in their ethnographic study:

> Because of the fact that the gifted pupils enjoyed the enrichment activities and received a great deal of personal attention from the teacher, these pupils coveted their enrichment time. They freely gave up their recess and free time to go to enrichment activities and demanded "makeup" classes when the enrichment class had to be canceled. (p. 24)

In addition to concluding from this observational study that different practices need to be provided to gifted and talented students in the regular classroom, a convincing argument can be made for retaining these programs for gifted and talented students.

Limitations and Delimitations

As described in Chapter 3, several procedures were used in the study to support the reliability of the CPR instrument and observers' coding procedures. However, it must be acknowledged that potential sources of error exist in research of this type. The CPR includes six category codings to indicate the existence of curricular or instructional differentiation. A numeral 6 was used to indicate "other" forms of differentiation that did not apply to the differentiation categories denoted by numerals 1 through 5. Each time an observer used the numeral 6, he or she included a description of that particular coded activity in the Miscellaneous Notes column on the same page. In reviewing these Miscellaneous Notes, some inconsistency was found. On two occasions observers used a numeral 6 to indicate differentiation when the target gifted students were in the Gifted and Talented Resource Room. This does not denote differentiation of curriculum and instruction in the regular classroom. On two other occasions, observers used the numeral 6 to indicate differentiation by homogenous grouping for reading or mathematics, although a separate set of codes was used to indicate grouping practices. This inconsistency in the use of the numeral 6 may threaten the internal validity of the study. In fact, it suggests that the finding of no differentiation in 84% of the activities may be an underestimation of the percentage of activities that contain no differentiation.

The inconsistency in using the "other" category may have been related to the length of the time the observers were in the classroom. Isaac and Michael (1990) state that an observer's "judgment may vary because he [she] becomes more experienced and discriminating, and more fatigued and careless" (p. 60). All observers in the study were experienced classroom teachers with background in the education of the gifted, and even though the target behaviors were defined and described in the training manual, individual observers may have brought preconceived notions of the quality of various types of differentiated activities. The observers may have also had expectations for the existence of differentiation in the regular classroom. Therefore, after long periods of observing no evidence of instructional differentiation, an observer may have become either more discriminating in the coding of differentiation activities or less discriminating in the use of the "other" category.

Although procedures were established to minimize observer effects, the presence of observers in the classroom may have altered the behavior of the classroom teachers and the students. Their awareness of the observers represents a threat to internal validity by possibly changing the nature of the behaviors being measured. This in turn represents a threat to external validity by reducing the generalizability of the findings to nonexperimental classrooms (Isaac & Michael, 1990). The use of volunteers may also affect the generalizability of the findings.

It must be acknowledged that observations in a few third and fourth grade classrooms in this study indicated that some differentiated instructional and curricular practices were provided to target gifted students. What staff development, time, administrative or parental factors influence these practices? What are the teacher variables that make a difference? What aspects of a gifted education program have an

impact on the practices used in the regular classroom? These are among the issues and questions being explored currently in an ethnographic study conducted by The National Research Center on the Gifted and Talented designed to follow-up on the Classroom Practices Study and describe effective practices currently being used to meet the needs of gifted students in regular classroom settings.

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Appendix A

Observation Manual for the Classroom Practices Record (CPR)

Observation Manual
for the
Classroom Practices Record (CPR)

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TABLE OF CONTENTS

Introduction

Background

The Classroom Practices Study has been undertaken by The National Research Center on the Gifted and Talented (NRC/GT) to examine the instructional practices used with gifted and talented students in regular classrooms. Descriptive information about these practices is being obtained through a national survey of 7000 third and fourth grade teachers and observations in approximately 50 classrooms.

The Classroom Practices Record (CPR), the instrument used for the observation portion of the study, is designed to document the differentiated instruction that gifted and talented students receive through modifications in curricular activities, materials, and verbal interactions between teachers and students. This instrument was adapted from the Classroom Observation Instrument (Giesen & Sirotnik, 1979) used by Goodlad (1984) in his "Study of Schooling in the United States" and the Classroom Activity Record developed by Evertson and Burry (1989). This manual describes the procedures for using the Classroom Practices Record when conducting classroom observations.

Overview of the CPR

The Classroom Practices Record (CPR) contains six sections: Identification Information, Physical Environment Inventory, Curricular Activities, Verbal Interactions, Teacher Interview Record, and Daily Summary (See Appendix A for a copy of the CPR instrument).

The first section, Identification Information, provides a record of the school, the teacher, and target students observed. Target Student #1 refers to an identified gifted and talented student or superior ability student. Target Student #2 refers to an average ability student selected for observation. The CPR is designed to provide descriptive information on two students only, not the entire class.

The second section, Physical Environment Inventory, records the availability and types of learning/interest centers, the seating pattern, and the location of the two target students in the classroom.

The third section, Curricular Activities, solicits information about the types of curricular activities that occur throughout the school day. Grouping practices and evidence of curricular differentiation experienced by Target Student #1, the target gifted or superior ability student, are recorded in this section.

The fourth section, Verbal Interactions, is used in conjunction with the Curricular Activities section and is completed whenever a verbal interaction transpires between the teacher and target students (or vice versa).

The fifth section, Teacher Interview Schedule, contains topics that the observer discusses with the classroom teacher to clarify or elaborate on information recorded in the Curricular Activities section.

The sixth section, Daily Summary, provides a summary record of the differentiation observed in the classroom.

Observation Arrangements and Procedures

Collection of Advance Materials

Observations for the Classroom Practices Study are conducted in regular third and fourth grade classrooms throughout the country. An observer spends two, nonconsecutive days recording observations in each classroom. After arrangements have been made with a particular school and classroom teacher for the dates of the two observation days, the observer sends a letter (Appendix B) to the teacher that stresses the importance of observing typical days in the classroom and, also, requests him or her to complete three forms: (1) the student roster(s), (2) a diagram of the seating arrangement in the classroom, and (3) the daily schedule. The letter emphasizes that the teacher is not being evaluated and should not consciously change his or her behavior because an observer is present in the classroom. The letter also reminds the teacher that the observer intends to use a tape recorder in the classroom to aid in reviewing verbal interaction sequences that are lengthy and, therefore, difficult to code in the Verbal Interactions section of the CPR. The letter explains further that the observer's notes will not be shared with the teacher or the teacher's supervisor(s) and assures the teacher that all information will be kept confidential.

Student rosters (Appendix C) are completed by the classroom teacher and mailed to the observer before the first observation day. A completed student roster provides the observer with a list of all students' first names, as well as students' gender, ethnicity, participation in a free or reduced lunch program, placement in special programs, ability level, and composite percentile score on a standardized achievement test. It may be necessary to obtain additional student rosters if the following two situations occur in the

school. First, if students in the class are grouped by ability for different subjects and the classroom teacher receives students from other classrooms, the teacher completes a student roster for each of the classes he or she teaches. For example, if the classroom teacher is responsible for teaching reading to students who are not all members of his or her homeroom class, the teacher provides the observer with a student roster for the reading "class". The second situation is as follows: if the classroom teacher's average and above-average ability students receive instruction from another teacher(s) for one of the major subjects, the classroom teacher asks the other teacher to complete a roster on that group in the event that the observer decides to follow these students. The classroom teacher is asked to do this, but is not told that the observer will, in fact, most likely follow the gifted and talented or superior ability students.

In addition to completing and returning the student roster(s) in advance of the observation, the teacher sketches and returns a diagram that indicates where each student sits in the classroom for each subject. The classroom teacher also completes a daily schedule for the observer. The schedule helps the observer determine the number and location of subjects taught during the day, as well as the number of teachers who work with the homeroom students.

Procedures for Selecting Target Students

One of the goals of the classroom practices study is to observe underserved, bright students in the regular classroom. Because of this, it is important to select target students that are representative of the following groups: multicultural, economically

disadvantaged, limited English proficient, and handicapped students. The procedures for selecting target students are described below.

Before the students arrive in the classroom, the observer selects two target students from the student roster. The classroom teacher does not know the specific students or the number of students being observed. The observer selects one identified gifted and talented or superior student (Target Student #1 on the CPR) and one average student (Target Student #2 on the CPR). The observer determines where these students sit in the classroom from the seating chart prepared by the teacher. To ensure that a diverse group of students are represented in the study, the observer should select target students according to the following steps:

1. The observer compiles a list of potential Target Student #1's by selecting students identified for the school's gifted education program. If no gifted program exists, the observer lists both (1) the students who received ability ratings with a numeral 5 or 4, and (2) the students who received a composite score at or above the 90th percentile on an achievement test. For purposes of this study, students on either of these lists will be defined as gifted and talented or superior ability students.

2. From the above list, the observer selects all students as potential Target Student #1's who qualify for the free or reduced school lunch program.

3. If one or more students are selected at Step 2, the observer randomly selects from among them, a non-Caucasian student as Target Student #1. If only one non-Caucasian student satisfies the criteria in Step 1 and Step 2, that student is designated as Target Student #1.

4. If no students are selected to this point, the observer selects as Target Student #1 a non-Caucasian student who does not qualify for free or reduced lunch.

5. If no students are selected by Step 3 and 4 above, the observer selects a Caucasian student designated at Step 1 as Target Student #1.

6. The observer selects, also, a back-up student for Target Student #1 (using the above steps) in the event that the first student is absent on the day of the observation.

7. Then, the observer selects an average ability student, Target Student #2, who received an ability rating with a Numeral 3 on the roster. If possible, this student is the same gender and race as Target Student #1 to reduce potential biases that may have an impact on the research results.

On the second observation day at each site, the observer follows the steps listed above to select two different students as Target Student #1 and Target Student #2. However, if non-Caucasian students were selected on the first day, the observer skips Steps 3 and 4 above and selects Caucasian students on the second day.

Observer's Arrival in the Classroom

The observer arranges to be in the classroom approximately one-half hour before students arrive in the morning to review with the teacher the purpose of the observation (observe a typical day in a classroom) and become familiar with the classroom and the teacher's schedule. The observer also provides the teacher with a written script for introducing the visitor (observer) to the students (Appendix D). Classroom teachers may paraphrase the script but should explain to students that the visitor wants to see a regular day in this school and is not evaluating the teacher or students.

If the teacher with whom the arrangements have been made is absent on the morning of the scheduled observation, the observer goes to the alternate teacher's classroom. The alternate teacher is not a substitute teacher; rather, it is the teacher who agreed to allow the observation to take place in his or her classroom on short notice in the event the teacher scheduled for the observation is ill.

To record information on the CPR throughout the day, the observer arranges to sit in the classroom in an out-of-the way location because he or she is not participating in classroom activities or assisting the teacher. By doing this, students are less likely to

react to the presence of the observer in the classroom. The observer may find it necessary, at times, to move around the room to look over a student's shoulder to see the type of work a student is doing.

During the time before students arrive, the observer sets up the tape recorder with the counter facing the observer. The observer should be equipped with fresh batteries and five hours of cassette tapes. The setting on the counter must be set at 000 at the beginning of each side of a tape. Each cassette tape should be labeled with the observer's name and the date of the observation.

Procedures for Special Schedules

If students receive instruction in language arts (reading, language, spelling, and penmanship), mathematics, social studies, and science from the homeroom teacher, the observer remains in the homeroom teacher's classroom during these instructional periods. However, if students are ability grouped for different subjects or switch classrooms within the grade level or across grade levels, the observer follows the special procedures listed below:

1. If the entire homeroom class goes to another teacher for instruction in one of the above subjects, the observer accompanies the class. For example, if all students in the classroom receive instruction from a science teacher, the observation takes place in the science teacher's classroom and the observer continues to record observations on the selected target students.

2. If Target Student #1, the target gifted and talented or superior ability student, leaves the classroom and other gifted and talented or superior students remain in the classroom, the observer substitutes one of these remaining gifted and talented or superior ability students for observation (of same gender and ethnicity, if possible) during the time when the previously selected Target Student #1 is absent from the classroom.

3. If Target Student #1 leaves the classroom with a group of other gifted and talented students and substitution is not possible, the observer accompanies that group of students to the class they attend. For example, all of the gifted and talented or superior students may go to another room for a reading class or a math class. The only exception to this rule is if the gifted and talented students go to a gifted education resource room. If this occurs, the observer remains in the homeroom and records observations on the average student only.

4. If the average student, Target Student #2, leaves the classroom, the observer substitutes, if possible, another average student for the observation.

If substitutions for Target Student #1 or Target Student #2 are made during the observation day, the observer records this in the Miscellaneous Notes column on the Curricular Activities section of the CPR.

Description of the CPR Instrument

CPR: Identification Information

The observer records the identification information found on the first section of the CPR.

CPR: Physical Environment Inventory

The observer indicates the number of and the topics addressed by the learning centers or interest development centers in the classroom. Learning centers often contain task cards or lists of activities to be completed by students. For example, a center containing drill and practice materials on punctuation would be considered a learning center. Interest development centers contain materials and/or activities designed to motivate students to learn more about a topic. For example, a center containing books and materials on the achievements of women throughout history would be considered an interest development center. Students' penmanship papers, students' creative writing papers, or a poster of flags around the world stapled to a bulletin board do not constitute learning or interest development centers.

CPR: Curricular Activities, List of Codes

The Curricular Activities section is the major focus of the CPR. This is the section where observations of curricular differentiation experienced by the target gifted and talented or superior ability student are recorded.

The observer records information about the academic subject, instructional activities, grouping practices, and differentiation experienced by Target Student #1 in the

columns on page 2 of the CPR. Four separate Curricular Activities pages are recorded during language arts (reading, language, spelling, penmanship), mathematics, social studies, and science instruction. The codes for this form are listed below.

Beginning Time: Note the time when each activity begins

Ending Time: Note the time when each activity ends

Activity Codes, i.e., Target Student #1 is involved in:

(1) audio visual
(2) demonstration
(3) discussion
(4) explain/lecture
(5) games
(6) non-academic activity
(7) oral reading
(8) project work
(9) review/recitation
(10) silent reading
(11) simulation/role playing
(12) testing
(13) verbal practice or performance
(14) written assignments

Group Size Codes, i.e., Target Student #1 is working

(1) individually, (2) in a group of 2-6 students, (3) in a group of 7 or more students, (4) with the total class

Group Composition Codes: (Ht) heterogeneous ability grouping, (Hm) homogeneous ability grouping

Descriptive Notes: Codes and explanations when Target Student #1 is involved in curricular experiences different than those experienced by Target Student #2 .

(1) Target Student #1 is involved in advanced content instruction/materials
(2) Target Student #1 is involved in advanced process instruction/materials
(3) Target Student #1 is working on an advanced product or project
(4) Target Student #1 is working on an independent study project based on assigned topic
(5) Target Student #1 is working on an independent study project based on self-selected topic
(6) Other indications of differentiation experienced by Target Student #1.

Misc. Notes: Any notes to which the observer may wish to refer later when conducting the teacher interview and/or writing the summary report are recorded in this column. See sample CPR in the Appendix E.

Definitions of Activity Codes. There are fourteen categories of classroom activities. Whenever an activity begins, the beginning time is indicated in the Beginning Time column. The appropriate code for the activity is noted in the Activity Code

column. When the activity changes, the Ending Time is recorded and the new Beginning Time and new activity code are recorded. Activity categories are described below.

Activity Code No.	Definitions

1. **Audio visual.** Students are watching a film, filmstrip, slide show, video, or they are listening to a recording. This is a passive activity, as opposed to an interaction with a visual medium, such as a computer or video disk. If students are working at a computer and are involved in a game, written assignment, or computer simulation, the activity should be recorded as a game, written assignment, or simulation.

2. **Demonstration**. An individual or group of individuals is showing how something works or is done. For example, in mathematics, a teacher may demonstrate how to construct polyhedrons or in language arts, how to conduct an interview. Students, instead of a teacher, may be demonstrating to other students how something is done.

3. **Discussion**. Students themselves or the teacher and students together are involved in an extended verbal exchange of ideas or opinions that may be a planned or an impromptu activity. For example, a discussion may be about places in the home where triangular shapes are found or about a local or global problem, such as protecting the rain forest.

4. **Explain/Lecture.** Teacher is presenting a lecture or explaining academic content to students. This may also include some questioning or comments from students, but the main function of this activity is informing students, introducing new material, or explaining new material to students.

5. **Games.** Students are involved in cooperative or competitive games, such as board games, chalkboard races, spell-downs, ...

6. **Non-academic Activity**. Students are involved in physical activity or conversation that is unrelated to classroom concerns or are not involved in an academic activity. Students are waiting for assistance, directions, instruction, or access to materials and equipment. Students' "show and tell" or "sharing time" is coded as this category.

7. **Oral Reading.** Students are involved in an activity that requires oral reading of material, such as a current events publication or basal reading text.

8. **Project Work.** Students are involved in projects, experiments, or tasks that require the construction or manipulation of materials, such as the development of dioramas, mobiles, or seed growth experiments.

9. **Review/Recitation.** Teacher is providing oral practice of skills or review of material. This category includes questioning of students by the teacher.

10. **Silent Reading.** Students are reading individually.

11. **Simulation/Role Playing**. Students are involved in structured activities that attempt to teach concepts by modeling real-world situations, such as recreating the Boston Tea Party or an archaeological expedition in class. This category does not include practice or performance of a play, which would be coded under category #13.

12. **Testing.** Students work on a test, quiz, readiness test or assessment.

13. **Verbal Practice or Performance.** Students are involved in verbal activities, such as debate, drama practice or performance, or singing.

14. **Written Assignments.** Students are writing papers, doing computation or are engaged in any other written work. Brief directions for the assignments or short teacher interruptions to explain or clarify directions may occur during the written assignment time and are not recorded as a separate activity.

If Target Student #2, the target average student, is involved in an activity that is different than the one experienced by Target Student #1, the observer records Target Student #2's activity in the Miscellaneous Notes column.

Definitions of Group Size Codes. With each activity change, the observer records the size of the group in which Target Student #1 is working by placing a code in the Group Size column. Numeral 1 is coded if the Target Student #1 is working individually, Numeral 2 is coded if Target Student #1 is working with a group of 2-6 students, Numeral 3 is coded for a group of 7 or more students, and Numeral 4 refers to the total class. If Target Student #2, the target average ability student, is working in a

different size group than Target Student #1, the observer indicates this in the Miscellaneous Notes column.

Definitions of Group Composition Codes. The second "group" column is used to record the composition of the group in which Target Student #1 is working. "Ht" is noted if the students are heterogeneously grouped by ability for the activity, and "Hm" is recorded if the students are homogeneously grouped by ability for the activity. The student roster helps determine the group composition, but the observer may need to clarify this at the end of the day during the teacher interview.

Definitions of Descriptive Notes. The column, Codes and Descriptive Notes of Differentiation, is used to record evidence of Target Student #1's involvement in curricular experiences that are different than those experienced by Target Student #2. The codes are explained below.

1. **Numeral 1** is coded when the target gifted or superior ability student is working with advanced content material or is receiving advanced content-related instruction. For example, this student may be reading a higher level reading or math text or trade book, using primary or secondary source materials instead of a social studies textbook, or learning higher-level science concepts.

2. **Numeral 2** is coded when the target gifted or superior ability student is involved in advanced process instruction or materials. The instructor may be providing the student, individually or in a group, with training in critical or creative thinking processes, such as deductive reasoning or creative problem solving skills. The instructor may be teaching "learning-how-to-learn" processes, such as how to evaluate speakers' points of view, develop data-recording matrices, or prepare tables and graphs. Numeral 2 may also be used to record when Target Student #1 is receiving instruction on advanced research skills and reference materials, such as identifying community resources or using specialized reference books. Advanced process instruction/materials also includes training in written,

oral, and visual communication skills, such as applying expository writing to a new genre, practicing vocal delivery, or preparing video tape recordings.

3. **Numeral 3** is recorded when Target Student #1 is working on an advanced product or project. Products cannot be separated entirely from content or process; advanced products require advanced content and process instruction. The reverse is not necessarily true; advanced content and process instruction do not always result in an advanced product. Products can assume a variety of forms, such as research reports, presentations, dramatic productions, displays, or constructions. The nature of the products developed by the gifted or superior student(s) is a form of differentiation. For example, in mathematics the entire class may be constructing cookie houses, but the gifted or superior ability student(s) may be required to use a metric scale in the cookie house design. In social studies, the class may be developing displays for Women's History Week, and the gifted or superior student(s) may be required to include original research reports rather than accounts from encyclopedias in the display. The audiences for whom the products are being developed should also be described in the Descriptive Notes column. Some products may be intended for the teacher and will be evaluated only by the teacher. Other products may be developed to have impact upon "real audiences". For example, a student's research paper or story may be submitted to a professional publication, or a student's science project may be entered in a regional science fair. If it is not possible to determine the audience for whom the product is intended, this information is obtained during the teacher interview and is recorded in the Descriptive Notes column.

4. **Numeral 4** is recorded when Target Student #1 is working on an independent study project, individually or with a small group of students, on an assigned topic. For example, the teacher may ask Target Student #1 to research a sea mammal or a famous mathematician as an alternate assignment in science or mathematics class.

5. **Numeral 5** is recorded when Target Student #1 is working on an independent study project based on a self-selected topic. The student is given the opportunity to pursue an interest area by investigating topics of his or her choice such as space exploration, the lives of favorite authors, number systems, or political elections.

6. **Numeral 6** is recorded for other indications of differentiation that are not included in the previous categories. For example, the target gifted or superior student may be assigned to be the leader of a cooperative learning group.

If the observer sees no indications of curricular differentiation, the column is left blank. The observer reports the lack of differentiation in the summary report written at the end of the day.

Explanation of Miscellaneous Notes. Miscellaneous Notes on the Curricular Activities page is the column where the observer records any notes to which he or she may want to refer later when conducting the teacher interview or writing the summary report. For example, the name of the specific activity being observed or the location of a target gifted or superior student when out of the homeroom classroom is listed here.

CPR: Verbal Interactions, List of Codes

While recording observations of curricular activities on page 2 of the CPR, the observer also records all verbal interactions that occur between the teacher and target students (or vice versa) on page 3 of the CPR. Thus, the observer records observations on two pages of the CPR at the same time throughout the periods when reading, language arts, science, social studies, and mathematics are taught. The observer will not be able to record verbal interactions that are whispered or said quietly between the teacher and target students. If the verbal interactions between the teacher and target students occur rapidly, the observer records the counter number on the cassette tape to complete the recording of the interaction sequences at a later time. The verbal interaction codes are listed below.

Who or To Whom: (T) Teaching Adult, (S#1) Target Student #1, (S#2) Target Student #2, (NT) Non-Target Student, (AL) Students At -Large

What:

(KC) Knowledge/Comprehension Question
(HOTS) Higher Order Thinking Skills Question
(RC) Request or Command
(ES) Explanation or Statement
(R) Response
(N) No Verbal Response

Wait Time: (_) minimum of 3 seconds pre-or post-response time

Explanation of Who/To Whom Column. Whenever the teacher interacts verbally with the target students, or vice versa, the observer records the verbal interactions between them. The person who initiates the interaction, Teaching Adult, Target Student #1, or Target Student #2, is coded in the Who column, and the person(s) to whom it is directed is coded in the To Whom column. (Note: interactions initiated by non-target students are not recorded.) For every code in the Who column, there is a corresponding code in the To Whom column.

If the teacher addresses a question, request, or explanation to the students-at-large, a "T" is coded in the Who column, an "AL" is coded in the To Whom column. If a target student responds, the target student code (S#1 or S#2) is coded in the Who column of the next line (Example C: Verbal Interaction Sequence on page 22 of this manual illustrates this coding.) If, however, a non-target student responds, no coding is necessary for the response, and the observer draws a curved or squiggly line across of the verbal interaction columns. If the teacher addresses a question or request to a specific non-target student, the observer records this by coding a "T" in the Who column and an "NT" in the To Whom column; however, a squiggly line is drawn below this to indicate the non-target student's response.

Explanation of What Column. The What column contains six codes which are categories of actions or behaviors. These codes are the verbs of the interaction sequences.

If the verbal interaction is in the form of a question, the observer records either "KC" for a Knowledge/Comprehension question or "HOTS" for a Higher Order Thinking Skills question. These categories represent levels of thinking described in Bloom's

Taxonomy of Educational Objectives (1956). The observer uses a "KC" code in the What column if a teacher asks students to recall or demonstrate understanding of previously learned material, i.e., the knowledge or comprehension level of the taxonomy. The observer places a "HOTS" code in the What column if a teacher (or it could be a student) asks a higher order thinking skills question, i.e., Bloom's application, analysis, synthesis, and evaluation levels of thinking. The observer does not distinguish among these higher levels; rather, he or she uses the "HOTS" acronym to note that a higher order thinking skill question was raised.

Whenever a "HOTS" question is asked at the beginning of a discussion that seems to be open-ended and conducive to the asking of "HOTS" questions, the observer writes down the counter number in the Miscellaneous Notes column. By recording the counter number, the observer will find it less difficult to later retrieve these questions and verify the coding.

Although the observer does not need to make distinctions among the higher levels of thinking, the following explanations for each of the four levels may help observers better understand the questions that are coded "HOTS". Application questions require the transfer of learned material to solve problems or make use of information. Analysis questions ask the learner to break information into separate parts, analyze the relationship among the parts, and to recognize the organizational principles of the parts. Synthesis questions ask the learner to put parts together to form a new whole. Synthesis questions usually require creative thinking on the part of the learner. Evaluation questions ask the learner to judge the value of information for a given purpose (See Appendix F for additional explanation of the levels in Bloom's taxonomy).

If the verbal interaction between the teacher or target students is in the form of a request or command, "RC" is placed in the What column. If the interaction is an explanation or statement, "ES" is coded in the What Column. After a question, an "R" for a response and "N" for no response are coded in the What column.

Teachers frequently preface questions with explanations or statements. Therefore, if the teacher begins a verbal interaction with an explanation or statement (ES) followed immediately by a question, the observer records the type of question in the What column and does not record the explanation or statement (ES).

Explanation of Wait Time Column. Wait time is the length of the pauses separating utterances during verbal interactions. Pre-response wait time refers to the pause or elapsed silent time after a question has been asked. Post-response wait time refers to the pause after an answer has been given, but before a verbal judgment or comment has been made about that answer. The observer places a check mark (√) in the Wait Time column if the pre-or post-response wait time exceeds the minimum of three seconds. The observer may use his or her pulse or the second hand of a clock or watch to determine the amount of pre or post response time that occurs in verbal interaction sequences.

Explanation of Miscellaneous Notes Column. Observers may make comments in the Miscellaneous Notes column on page three of the CPR. The observer may decide to write down the verbatim question or comment made by the teacher or students or make a note to which he or she may refer when conducting the teacher interview or writing the daily summary. For example, the observer may notice that the teacher frequently or always initiates class discussions by addressing questions to Target Student #1, and

writes this observation in the Miscellaneous Notes as a reminder to include this in the Daily Summary. If the observer develops his or her own coding system for noting unexpected events in the Miscellaneous Notes column, the observer should provide a legend for these notes.

The three examples below illustrate verbal interaction sequences. Note, observers place a **double** line after each a total interaction sequence to indicate the completion of the sequence. An additional practice exercise for coding verbal interaction sequences is included in the Home

Training section of this manual.

Example A: Interaction Sequence

T: "What was the main character's name?"

S#2: "Mrs. Jewels."

Who	To Whom	What	Wait Time	Miscellaneous Notes
T	S#2	KC		
S#2	T	R		

Example B: Interaction Sequence

T: "Mark, if you were a pharaoh, how would you rule?"

S#1: "For one thing, I'd let my people have whatever religion they wanted."

T: "Why do you think this is important?"

S#1: "Because people should have freedom to worship however they want."

T: "Yes, the Pilgrims thought freedom to worship was important too".

Who	To Whom	What	Wait Time	Miscellaneous Notes
T	S#1	HOTS		
S#1	T	R		
T	S#1	HOTS		
S#1	T	R		
T	S#1	ES		

Example C: Interaction Sequence

T: "Class, what could be a different ending for this story?"

S#2: "I think the boy should have returned home."

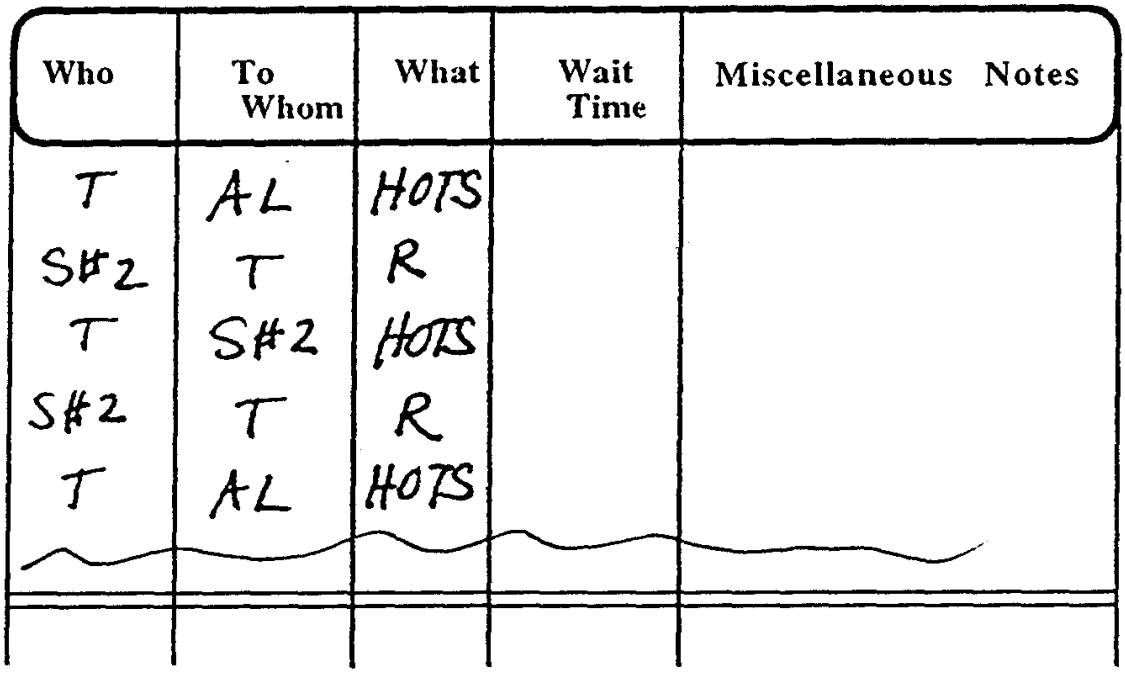
T: "Why do you think so?"

S#2: "I just like happy endings."

T: "Class, what are some other possible endings for this story?"

Non-target Student: "Perhaps the boy could have gone to ....."

Discussion continues between teacher and non-target students....



Who	To Whom	What	Wait Time	Miscellaneous Notes
T	AL	HOTS		
S#2	T	R		
T	S#2	HOTS		
S#2	T	R		
T	AL	HOTS		

CPR: Interview

Interviews with teachers are conducted at the end of the school day. At the end of the first observation day, the observer uses the interview schedule found on page 4 of the CPR with the homeroom teacher to follow-up on observations recorded throughout the day. At the end of the second observation day, the observer interviews other teachers (if any) who provided instruction (on either observation day) to the target gifted and talented students, Target Student #1's. The observer does not probe during the interview to obtain teachers' opinions regarding grouping or curricular differentiation; rather, the observer asks questions designed to clarify the use of these practices in the classroom. If a teacher rated a student high in ability and the student scored in the average range on an achievement test, the observer could ask questions to determine the basis for that rating; however, the observer does not reveal to the teacher during the interview that observations were conducted on only two students throughout each day.

CPR: Daily Summary

At the conclusion of each observation day, the observer writes a summary report that describes the instructional situation (self-contained, departmentalized, ability grouping across classrooms or grade levels, ...) and summarizes the observed differentiation experienced by the target gifted and talented or superior ability student. The observer also notes any special or unique things observed during the day that made it an atypical day or a unique educational setting. The observer avoids writing subjective comments in the summary report; rather, the report should reflect the observations recorded on the CPR throughout the day. At the conclusion of the second observation day, the observer asks the classroom teacher to complete and return the Classroom Practices Survey.

Summary of Major Procedures

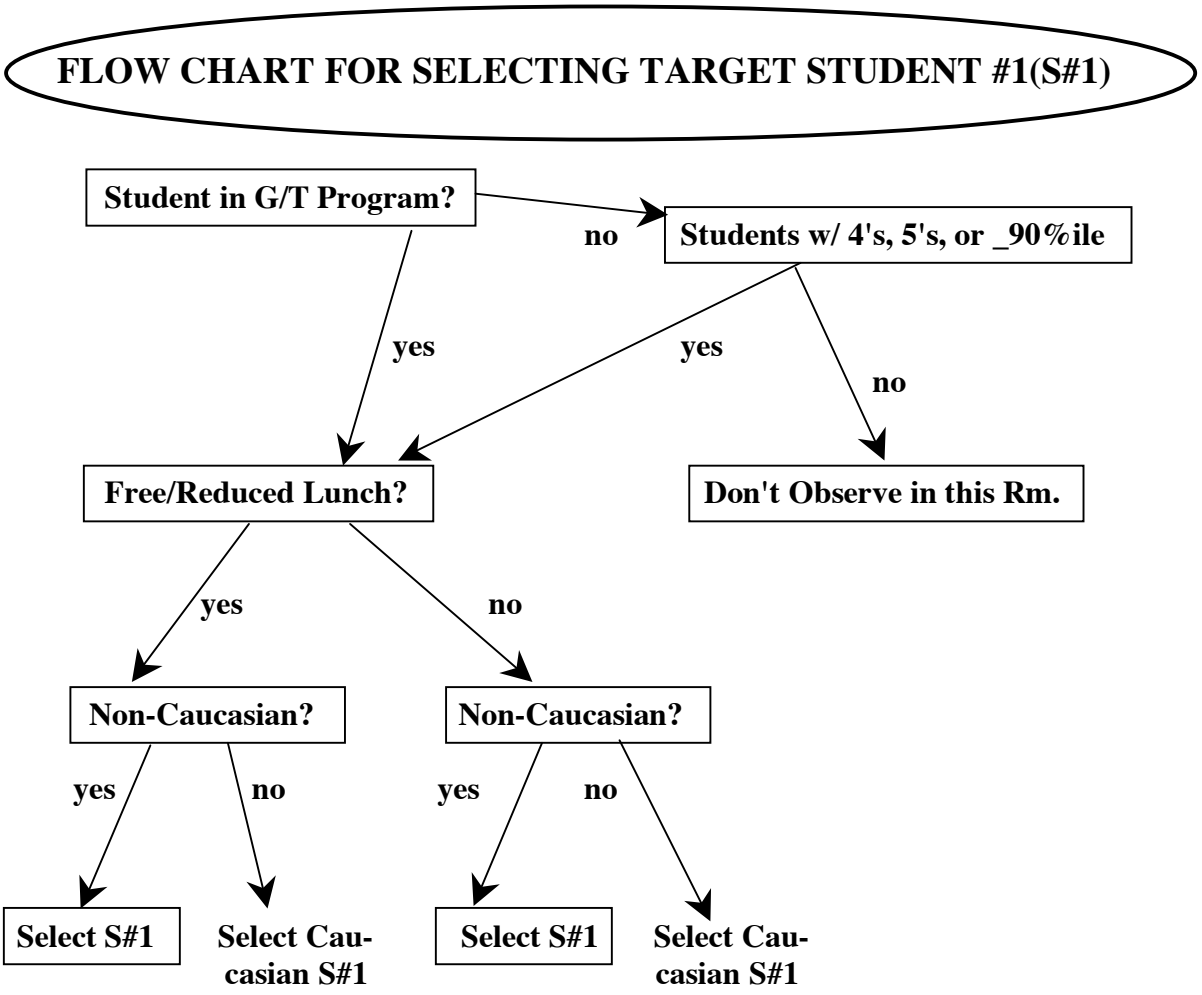
A summary of the major procedures for an observer to follow when conducting observations for the Classroom Practices Study are listed below.

1. Observations are conducted during instruction in five academic subjects:
   - reading
   - language arts (language, spelling, and penmanship)
   - mathematics
   - social studies
   - science

2. Observations on pages 2 and 3 of the CPR, the Curricular Activities and Verbal Interaction sections, are recorded simultaneously.

3. Two target students, one gifted and talented or superior student and one average ability student, are observed each day. If it is not possible to observe both an average student and gifted and talented student at the same time, the target gifted and talented or superior student is observed unless this student and all of the remaining potential target gifted and talented or superior students went to the gifted education resource room. If this occurs, only the target average student is observed.

4. If either the target gifted and talented/superior ability student or the target average student leaves the classroom, and other students of similar ability are available in the classroom, one of these remaining students is substituted for the observation during the time when the target student is absent.


FLOW CHART FOR SELECTING TARGET STUDENT #1(S#1)
Student in G/T Program?
no
Students w/ 4's, 5's, or _90%ile
yes
yes
no
Free/Reduced Lunch?
Don't Observe in this Rm.
yes
no
Non-Caucasian?
Non-Caucasian?
yes
no
yes
no
Select S#1
Select Cau-casian S#1
Select S#1
Select Cau-casian S#1

Home Training Exercise: Selection of Students From Student Roster

List potential Target Student #1's and Target Student #2's from the following roster.

STUDENT ROSTER

Teacher's Name_____ School ___ _____

I. Please list students' first names, gender, ethnicity (Caucasian-American, African-American, Asian-American, Hispanic-American, Native-American, Other) in the columns below.
II. Indicate the students who receive free or reduced lunch by placing a check mark (✓) in the subsidized lunch column.
III. In the ability rating column, please provide a general, numerical rating of each student's ability level that corresponds to the following scale: 5=superior, 4=above average, 3=average, 2=below average, 1=low. Please do not spend a great deal of time thinking about this--record your first reaction. This task should not take longer than five minutes.
IV. In the special program column, indicate the students who have been formally identified for a special program (special ed., gifted ed., Chapter I) by naming the program from which they are receiving special services.
V. In the last column, indicate the composite percentile score received by students' on their most recently administered standardized achievement test. Write the name of this test here. Stanford Achievement Test

Students' First Names (Add initial for duplicates.)	Gender	Ethnicity	Subsidized Lunch	Ability Rating	Special Program	Achiev. Percentile
1. Elias	M	Hisp/Am	✓	4		83
2. Megan D.	F	Caucasian		5	g/t	99
3. Heather	F	Cauc.		5	g/t	93
4. Shana	F	Hisp/Am		4		88
5. Jennifer A.	F	Cauc.		3		78
6. Jared	M	Cauc.		5	g/t	99
7. Elizabeth	F	Cauc		4		92
8. Miguel	M	Hisp/Amer.		3		80
9. Dolly	F	African/Am		3		79
10. Angela	F	Cauc		4		95
11. James	M	Cauc.	✓	1		40
12. Keith	M	Cauc.		5	g/t	97
13. Janina	F	Cauc		4		90
14. Jessica B.	F	Cauc	✓	2		65
15. José	M	Hisp/Am.		5	g/t	94
16. Margaret	F	Hisp/Am.		2		50
17. Jennifer L.	F	Cauc		3		82
18. Mallie	F	Cauc		5	g/t	95
19. Kristi	F	African/Am		2		65
20. Rebecca	F	Cauc.		1	EMR	34
21. Ricky	M	Cauc	✓	1	EMR	30
22. Samantha	F	Cauc		5		89
23. Meghan B.	F	Cauc		5		92
24. Brandon	M	Cauc		4		87
25. Kevin	M	Cauc		3		73
26. Yavitza	F	Hisp/Am.		4	bilingual	89
27. Jameson	M	Cauc.		5	LD	90

Answer to Home Training Exercise:
Selection of Students From Student Roster

Potential Target Student #1's: Jose'

Potential Target Student #2's: Miguel

Home Training Exercise: Curricular Activities

List the codes for the following curricular activities:

1. The teacher is showing students how to use microscopes, and spends a few minutes showing the target gifted or superior student how to use an electron microscope.
   Activity = _____ Grouping Size = _____ Differentiation = _____

2. The teacher and students in the reading class are discussing the script for a play that they are going to perform for the reading classes in the other rooms.
   Activity = _____ Grouping Size = _____ Differentiation = _____

3. Students of differing abilities are working in groups of 4-6 students on *Gold Rush*, a simulation game published by Interact, Inc.
   Activity = _____ Grouping Size = _____ Grouping Composition = _____

4. While the rest of the homeroom class is doing exercises in their reading workbooks, Target Student #1 is reading a book on acid rain, a topic that has interested her for years and a topic on which she intends to do an independent project.
   Activity = _____ Grouping Size = _____
   Differentiation = _____ Miscellaneous Notes = _____

(Answers for the above curricular activities are on the next page.)

Answers for Home Training Exercise: Curricular Activities

Codes are listed for the following curricular activities:

1. The teacher is showing students how to use microscopes, and spends a few minutes showing the target gifted or superior student how to use an electron microscope.
   Activity = *2* Grouping Size = *1* Differentiation =*2*

2. The teacher and students in the reading class are discussing the script for a play they are going to perform for the reading groups in the other rooms.
   Activity = *3* Grouping Size = *4*
   Differentiation = *blank*

3. Students of differing abilities are working in groups of 4-6 students on *Gold Rush*, a simulation game published by Interact, Inc.
   Activity = *11* Grouping Size = *2*
   Grouping Composition = *Ht*

4. While the rest of the homeroom class is doing exercises in their reading workbooks, Target Student #1 is reading a book on acid rain, a topic that has interested her for years and a topic on which she intends to do an independent project.
   Activity = *10* Grouping Size = *1*
   Differentiation = *5* Miscellaneous Notes = *S#2 is doing Act. #14 (wkbk.)*

Home Training Exercise: Verbal Interactions

Code the following verbal interaction sequence.

The teacher asked the class, "What was the major problem George Washington Carver found in the south that led him to develop so many uses for peanuts?"

Target Student #2 said, "Everyone there was growing cotton which was very hard on the soil."

The teacher asked the class, "What else?"

A Non-target Student replied, "The boll weevil insects were moving in on the cotton fields, and peanuts were a better crop."

The teacher said, "Yes, peanuts were better for the soil and weren't bothered by the boll weevils, but what was the problem with growing lots of peanuts?"

A Non-target Student answered, "They couldn't sell that many peanuts because they weren't used for much until Carver came up with new uses for them, such as new foods, soaps, and polishes."

The teacher said, "He even used the thin outer coverings of the peanuts for a new paper, didn't he? He was like a modern day recycler. Can you think of a waste product that we have an abundance of today for which we could come up with new uses?"

A Non-target Student replied, "Newspapers."

"Yes, and they now get recycled around here--can you think of other things?", said the teacher.

A Non-target Student said, "We have an abundance of styrofoam that is used in packages and is used for trays in the grocery stores."

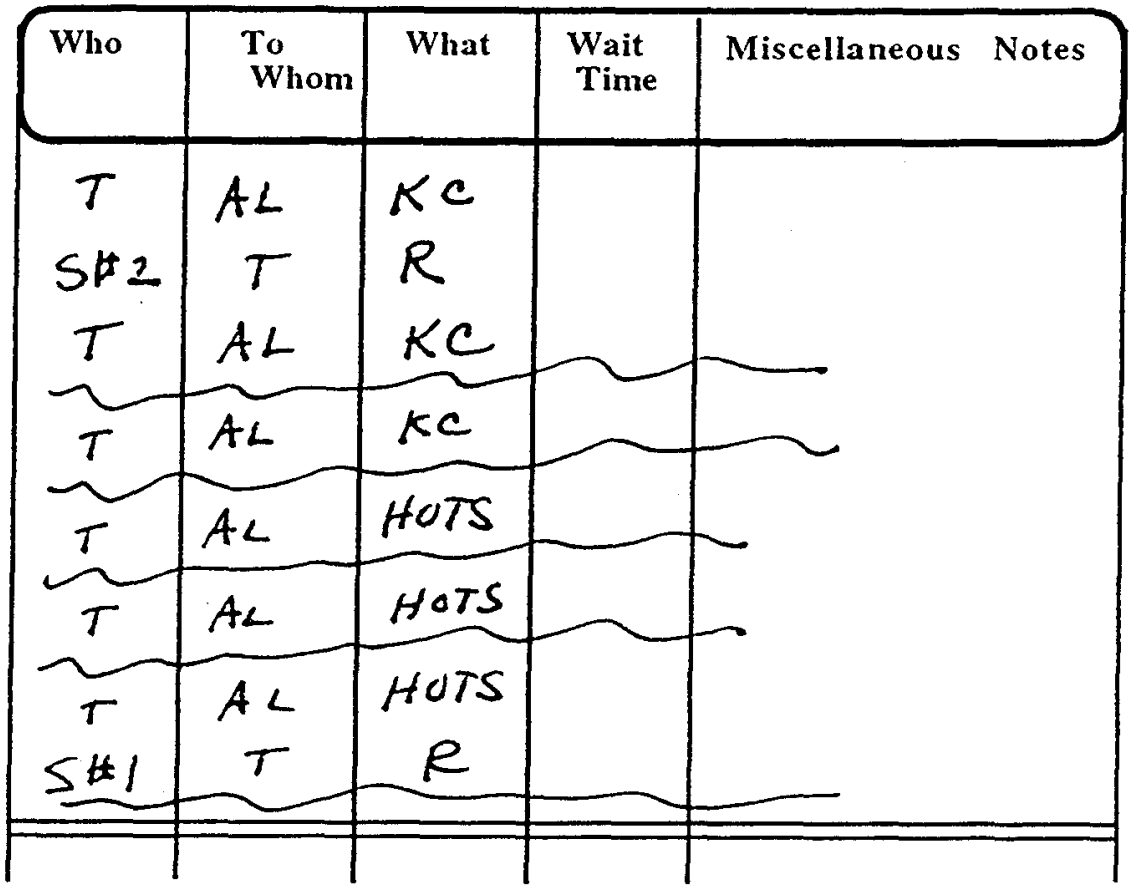
The teacher said, "Yes, that is a good one. Let's brainstorm--remember we don't judge ideas when we brainstorm-- what are some new, potential uses for styrofoam?"

Target Student #1 said, "How about using it for fuel?"

Several Non-target Students gave additional responses before discussion ended on this topic.

Who	To Whom	What	Wait Time	Miscellaneous Notes

Answer to Home Training Exercise: Verbal Interactions



Who	To Whom	What	Wait Time	Miscellaneous Notes
T	AL	KC		
SP2	T	R		
T	AL	KC		
T	AL	KC		
T	AL	HOTS		
T	AL	HOTS		
T	AL	HOTS		
SP1	T	R		

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Appendix A

Classroom Practices Record (CPR)

CPR: Identification Information

Date of Observation _____ Observer _____ Observation No. _____ (in this classroom)

Classroom Teacher_____ School _____

School District _____ City _____ State ____

Grade Level _____ No. of Students in Classroom _____ No. of Girls _____ No. of Boys _____

Target Student #1:

____ Gender (M/F)
____ Limited English Proficient (specify native language, _____)
____ Handicapping Condition (specify, _____)
____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:

___ African-American
___ Asian-American /Pacific Islander
___ Hispanic-American
___ Native-American
___ Caucasian-American
___ Other

Target Student #2:

____ Gender (M/F)
____ Limited English Proficient (specify native language, _____)
____ Handicapping Condition (specify, _____)
____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:

___ African-American
___ Asian-American/Pacific Islander
___ Hispanic-American
___ Native-American
___ Caucasian-American
___ Other

CPR: Physical Environment Inventory

Learning Centers:

_3 or more learning/interest centers (specify topics, _____ _____ _____)

_2 learning/interest centers (specify topics, _____ _____)

_1 learning/interest center (specify topic, _____)

_No learning/interest centers

Attach the classroom teacher's seating chart. Circle and label Target Student #1 (S#1) and Target Student #2 (S#2).

(CPR Instrument Developed by The University of Connecticut—The National Research Center on the Gifted and Talented)

CPR: Curricular Activities

Activity Codes, i.e., Tchr. Act. involving S#1:
(1) audio visual
(2) demonstration
(3) discussion
(4) explain/lecture
(5) games
(6) non-academic activity
(7) oral reading
(8) project work
(9) review/recitation
(10) silent reading
(11) simulation/role playing
(12) testing
(13) verbal practice or performance
(14) written assignments

Group Size Codes, i.e., Target Student #1 is working:
(1) individually
(2) in a group of 2-6 students
(3) in a group of 7 or more students
(4) with a total class

Group Composition Codes:
(Ht) heterogeneous ability grouping
(Hm) homogeneous ability grouping

Descriptive Notes:
(1) Target Student #1 is involved in advanced content instruction/materials
(2) Target Student #1 is involved in advanced process instruction/materials
(3) Target Student #1 is working on an advanced product or project work
(4) Target Student #1 is working on an independent study project based on assigned topic
(5) Target Student #1 is working on an independent study project based on self-selected topic
(6) Other indications of differentiation experienced by Target Student #1

Miscellaneous Notes: Observer's notes for recording S#2's activity, conducting the teacher interview, or writing the summary report.

Academic Subject: _____

Beg. Time	End. Time	Act.	Grp./Size Code	Grp./Cmp. Code	Codes & Descriptive Notes Code	Misc. Notes of Differentiation

CPR: Verbal Interactions

Who and To Whom Codes:

(T) Teaching adult
(S#1) Target Student #1
(S#2) Target Student #2
(NT) Non-target Student
(AL) Students At-Large

What Codes:

(KC) knowledge/comprehension question
(HOTS) higher-order thinking skills question
(RC) request or command
(ES) explanation or statement

(R) response
(N) no verbal response

Wait Time:

(√) minimum of 3 seconds pre or post response time

Who	To Whom	What	Wait Time	Miscellaneous Notes

(additional space on the back of this sheet)

CPR: Teacher Interview

Topics to be Discussed Include:

1. Typical Day--did the teacher believe he or she changed his or her behavior today? Did anything happen during the day that made it an atypical day?

2. If other adults or visitors were present in classroom, who were they and what was their role?

3. Clarification of Descriptive Notes on CPR: Curricular Activities.

4. Instructional and Curricular Differentiation-- clarification of differentiated materials, availability of enrichment resources, acceleration policies, ... If curricular modifications were observed, how does this affect student evaluation?

5. Student Grouping-- how groups are formed, flexibility of groups, ...

6. Teaching of Groups--how is the decision made with regard to who teaches a particular ability-level group?

7. Other

CPR: Daily Summary

Please summarize the observations made during the day. Describe the instructional setting, summarize the observed differentiation experienced by Target Student #1, and describe the frequency and type of verbal interactions between the teacher and Target Student #1. The major issue to be addressed is "Did Target Student #1 experience any differentiated instruction or curricular experiences than those experienced by Target Student #2?"

Circle the names of Target Student #1 and Target Student #2 on the Student Roster sheet and attach to this report.

Appendix B

[date]

[teacher name]
[teacher's school]
[teacher's address]
[teacher's city, state, zip]

Dear [teacher]:

Thank you for your willingness to allow [observer's name] to spend two days observing in your classroom next month. I am writing to confirm the dates that were arranged for these visits, to provide you with information about this observation study, and to explain three forms we would like you to complete before [observer's name] arrives in your classroom. [Principal's name] explained briefly to you that The University of Connecticut site of The National Research Center on the Gifted and Talented (NRC/GT) is conducting a "Classroom Practices Study", a national study designed to examine the curricular and instructional practices used with students in regular classrooms; however, you would probably appreciate additional information about this project.

Purpose of the Study

Although considerable research has been conducted on classroom practices, a systematic study of what happens to high ability students in the regular classroom has not been undertaken. The Classroom Practices Study addresses this need by examining the curricular and instructional practices used with high ability and average ability students in regular elementary classrooms. Descriptive information about these practices is being obtained from teacher surveys distributed to over 7000 third and fourth grade teachers and from structured observations conducted in approximately 50 third and fourth grade classrooms around the country.

Overview of the Observational Research for the Classroom Practices Study

On [first scheduled date] and [second scheduled date], [observer's name] will be recording observations on students in your [third or fourth] grade classroom. [Observer's name] will be recording information about the curricular activities experienced by students and the verbal interactions that occur in the classroom. [Observer's name] will use a tape recorder to assist with coding verbal interactions that are lengthy, and therefore, difficult to code when they occur.

As [principal] explained to you, we would like you to complete three forms before [observer's name] arrives in your classroom: (1) a student roster (enclosed), (2) a diagram of the seating arrangement in your classroom, and (3) a copy of your students' schedule. Note, please write students' first names only on the roster sheet and the diagram of where these students sit in the classroom. A completed roster will provide [observer's name] with a list of the students in your classroom, as well as students' gender, ethnicity, participation in a free or reduced lunch program, placement in special programs, ability level, and composite percentile scores on a standardized achievement test. Would you please discuss this observation with another teacher at your grade level and ask him or her to be prepared to complete the forms on short notice in the event you are ill on the day of the observer's visit to your classroom?

At the conclusion of the first visit on [first date], [observer's name] would like to spend approximately one-half hour with you to follow-up on questions [he or she] may have. If your students receive instruction in a basic subject area from another teacher, [he or she] may want to ask that teacher a few questions at the end of the second day, [second date].

Please be assured that strict confidentiality will be maintained for students, teachers, and districts who participate in this study. All data will be coded and analyzed in reference to codes. Only the state in which the observation occurred will be identified in research reports. [Observer's name] will not be evaluating you or your students--this is not an

evaluation study, rather it is a descriptive study. [Mr. or Mrs. observer's name]'s observation notes will not be shared with anyone in your school district.

If you have any questions about these visits or the study, please call me at 203-486-0167. A stamped, return envelope addressed to [observer's name] has been enclosed for mailing the completed student roster, your students' schedule, and the classroom seating diagram. Thank you for your willingness to assist with this research project by completing the forms and allowing us to visit in your classroom.

Sincerely,

Karen L. Westberg, Ph.D.
Assistant Professor, University of Connecticut Site of the NRC/GT

Enc. Student Roster Sheet & SAS Envelope

Appendix C

STUDENT ROSTER

Teacher's Name_____ **School** _____

I. Please list students' first names, gender, ethnicity (Caucasian-American, African-American, Asian-American, Hispanic-American, Native-American, Other) in the columns below.
II. Indicate the students who receive free or reduced lunch by placing a check mark (_) in the subsidized lunch column.
III. In the ability rating column, please provide a general, numerical rating of each student's ability level that corresponds to the following scale: 5=superior, 4=above average, 3=average, 2=below average, 1=low. Please do not spend a great deal of time thinking about this--record your first reaction. This task should not take longer than five minutes.
IV. In the special program column, indicate the students who have been formally identified for a special program (special ed., gifted ed., Chapter I) by naming the program from which they are receiving special services.
V. In the last column, indicate the composite percentile score received by students' on their most recently administered standardized achievement test. Write the name of this test here. _____

	Students' First Names (Add initial for duplicates.)	Gender	Ethnicity	Subsidized Lunch	Ability Rating	Special Program	Achiev. Percentile
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
20.							
21.							
22.							
23.							
24.							
25.							
26.							
27.							
28.							
29.							
30.							
31.							
32.							

Appendix D

Script for Classroom Teachers to Use When Introducing Observers:

As you can see we have a visitor in our classroom today. She/he is a teacher from _____ who is interested in seeing the types of things we do during a school day. Our visitor's name is Mr./Mrs./Miss _____.

She/he may write down some notes during the day. She/he is not grading or testing us....Mr./Mrs./Miss is just making notes for himself/herself. She/he wants to see a regular day in our classroom.

Appendix E

Classroom Practices Record (CPR) (Sample)

CPR: Identification Information

Date of Observation 2/21/91 Observer Mary Smith Observation No. 1 (in this classroom)

Classroom Teacher Mrs. T. Cher School Lincoln Elem.

School District Anytown School Dist. City Anytown State CT

Grade Level 4 No. of Students in Classroom 24 No. of Girls 13 No. of Boys 11

Target Student #1:

M Gender (M/F)

____ Limited English Proficient (specify native language, _____)

____ Handicapping Condition (specify, _____)

____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:

____ African-American
____ Asian-American /Pacific Islander
X Hispanic-American
____ Native-American
____ Caucasian-American
____ Other

Target Student #2:

M Gender (M/F)

____ Limited English Proficient (specify native language, _____)

____ Handicapping Condition (specify, _____)

____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:

____ African-American
____ Asian-American /Pacific Islander
X Hispanic-American
____ Native-American
____ Caucasian-American
____ Other

CPR: Physical Environment Inventory

Learning Centers:

X 3 or more learning/interest centers (specify topics, Rsch. Activ. Poetry Current Events)

____ 2 learning/interest centers (specify topics, _____ _____)

____ 1 learning/interest center (specify topic, _____)

____ No learning/interest centers

Attach the classroom teacher's seating chart. Circle and label Target Student #1 (S#1) and Target Student #2 (S#2).

(CPR Instrument Developed by The University of Connecticut--National Research Center on Gifted and Talented)

CPR: Curricular Activities

Activity Codes, i.e., Tchr. Act. involving S#1:
(1) audio visual
(2) demonstration
(3) discussion
(4) explain/lecture
(5) games
(6) non-academic activity
(7) oral reading
(8) project work
(9) review/recitation
(10) silent reading
(11) simulation/role playing
(12) testing
(13) verbal practice or performance
(14) written assignments

Group Size Codes, i.e., Target Student #1 is working:
(1) individually
(2) in a group of 2-6 students
(3) in a group of 7 or more students
(4) with a total class

Group Composition Codes:
(Ht) heterogeneous ability grouping
(Hm) homogeneous ability grouping

Descriptive Notes:
(1) Target Student #1 is involved in advanced content instruction/materials
(2) Target Student #1 is involved in advanced process instruction/materials
(3) Target Student #1 is working on an advanced product or project work
(4) Target Student #1 is working on an independent study project based on assigned topic
(5) Target Student #1 is working on an independent study project based on self-selected topic
(6) Other indications of differentiation experienced by Target Student #1

Miscellaneous Notes: Observer's notes for recording S#2's activity, conducting the teacher interview, or writing the summary report.

Academic Subject: Lang. Arts: Reading, Penmanship

Beg. Time	End. Time	Act. Code	Grp./Size Code	Grp./Cmp. Code	Codes & Descriptive Notes of Differentiation	Misc. Notes
10:10	10:15	4	4	Ht		Explanation ... broke into rdng. groups
10:15	10:30	14	3	Hm	S#1 in group w/ gr. 5 Basal	3 Rdng. Groups Here S#2: Activ. 10→14→3
10:30	11:00	3	3	Hm		
11:00	11:15	10	3	Hm		
11:15	11:25	6				Break
11:25	11:45	14	4	Ht		Penmanship Practice

CPR: Verbal Interactions

Who and To Whom Codes:
(T) Teaching adult
(S#1) Target Student #1
(S#2) Target Student #2
(NT) Non-target Student
(AL) Students At-Large

What Codes:
(KC) knowledge/comprehension question
(HOTS) higher-order thinking skills question
(RC) request or command
(ES) explanation or statement

(R) response
(N) no verbal response

Wait Time:
(√) minimum of 3 seconds pre or post response time

Who	To Whom	What	Wait Time	Miscellaneous Notes
				Tchrs. first disc. group v. small (couldn't hear disc.)
T	AL	KC		"Story told from who's viewpoint?"
S#1	T	R		
T	AL	HOTS	✓	"Why did author use a dif. pt. of view to tell the story? attention-grabber, ...
S#1	T	R		
T	AL	HOTS		
T	AL	HOTS		
T	AL	KC		"Summarize story for us."
S#2	T	R		
T	S#2	KC		"What was high pt. of story?"
S#2	T	R		
T	AL	KC		
T	AL	KC		

p. 3

CPR: Teacher Interview

Topics to be Discussed Include:

1. Typical Day--did the teacher believe he or she changed his or her behavior today? Did anything happen during the day that made it an atypical day?

   NO
   Nothing other than observer - but they frequently have observers in room.

2. If other adults or visitors were present in classroom, who were they and what was their role?

   Student teacher - just observing this week.

3. Clarification of Descriptive Notes on CPR: Curricular Activities.

   3 Rdng. Groups within the classroom.
   Top group's where in gr. 5 based. They did gr. 4 basal in 1 semester.

4. Instructional and Curricular Differentiation-- clarification of differentiated of materials, availability of enrichment resources, acceleration policies, ... If curricular modifications were observed, how does this affect student evaluation?

   Rdng. policy just changed this year. Kids making great progress moving thru' 2 texts in 1 year (top). Can eliminate lots of skills w/ top group (i.e., wkbk. pages, wkshts.) Use publishers criterion - referenced tests - top group consistently shows mastery & proj.

5. Student Grouping-- how groups are formed, flexibility of groups, ...

   - Rdng. groups formed on basis of rdng. assessment test in Sept. Some flexibility - moved some kids.
   - Has started cooperative lrng. groups in other subj. (not observed today) - heterogeneous (Johnson & Johnson model)

6. Teaching of Groups--how is the decision made with regard to who teaches a particular ability-level group?

   Not Applicable

7. Other

CPR: Daily Summary

Please summarize the observations made during the day. Describe the instructional setting, summarize the observed differentiation experienced by Target Student #1, and describe the frequency and type of verbal interactions between the teacher and Target Student #1.

This was a traditional, self-contained classroom. Students were ability grouped for reading only, (i.e., within class grouping). The top reading group is progressing through grade 4 and grade 5 basals in one year (a new policy permits this). The teacher has been able to eliminate much of the practice on skills found in the publisher's workbook and worksheets. Teacher reports that these students consistently demonstrate mastery (80% criterion) on publisher's criterion-referenced tests.

Whole class instruction was used in math, social studies, and science. No instructional or curricular differentiation for Target Student #1 was observed during these subjects. The teacher reported that she has started using heterogeneous, cooperative learning groups, but none were used during this observation day.

More verbal interactions occurred between the teacher and Target Student #1 as compared to those with Target Student #2. More HOTS questions were directed to S#1 than to S#2, but the majority of the teacher questions were at the knowledge/comprehension level. When difficult KC or HOTS questions were raised, the teacher gave more eye contact to high ability students.

Appendix F

Table II. Major Categories in the Cognitive Domain of the Taxonomy of Educational Objectives (Bloom, 1956)

Descriptions of the Major Categories in the Cognitive Domain
1. **Knowledge.** Knowledge is defined as the remembering of previously learned material. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in he cognitive domain.
2. **Comprehension.** Comprehension is defined as the ability to grasp the meaning or material. This may be shown by translating material from one form to another (words to numbers), by interpreting materials (explaining or summarizing), and by estimating future trends (predicting consequences or effects). These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.
3. **Application.** Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. Learning outcomes in this area require a higher level of understanding than those under comprehension.
4. **Analysis.** Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Learning outcomes here represent a higher intellectual level that comprehension and application because they require an understanding of both the content and the structural form of the material.
5. **Synthesis.** Synthesis refers to the ability to put parts together to form a new whole. This may involve the production of a unique communication (theme or speech), a plan or operations (research proposal), or a set of abstract relations (scheme of classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of *new* pattern or structure.
6. **Evaluation.** Evaluation is concerned with the ability to judge the value of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal criteria (organization) or external criteria (relevance to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgments based on clearly defined criteria.

Gronlund, N. E. (1985). Stating objectives for classroom instruction. New York: Macmillan.

Appendix B

List of Observers Who Conducted Observations

List of Observers Who Conducted Observations

Name	Home Address	Observations
Margaret Beecher	Torrington, Connecticut	2 days
Sally Dobyns	Lafayette, Louisiana	8 days
Linda Emerick	St. Paul, Minnesota	2 days
Christine Emmons	Storrs, Connecticut	6 days
Thomas Hébert	Willimantic, Connecticut	8 days
Thomas Hays	Honolulu, Hawaii	6 days
Kay Kelly	Indianapolis, Indiana	8 days
Karen Lelli	Charlottesville, Virginia	4 days
Marian Mathews	Portales, New Mexico	8 days
Terry Neu	Storrs, Connecticut	4 days
Richard Olenchak	Tuscaloosa, Alabama	4 days
Kay Paling	Charlottesville, Virginia	6 days
Jeanne Purcell	Marlborough, Connecticut	4 days
Thomas Salvin	Hamden, Connecticut	8 days
Gina Schack	Louisville, Kentucky	2 days
Shirley Weddel	Littleton, Colorado	6 days
Karen Westberg	Vernon, Connecticut	6 days

Appendix C

Training Exercise

Training Exercise for Conducting Observations for the Classroom Practices Study

The University of Connecticut
The National Research Center on the Gifted and Talented (NRC/GT)

Directions:

Use information from the attached Student Roster to select target students and record information about them on page one of the CPR (For this exercise, please put their first names on the page one of the CPR.) Then, use the information on the classroom description below to code the Curricular Activities and the Verbal Interaction sections of pages two and three of the CPR.

The teacher has just finished the roll call/lunch count procedures and at 9:05 begins the following activity with her fourth grade class. Her Daily Schedule indicates that on this day, this period is listed as "Current Events."

Teacher: Class, I would like to talk about something we haven't discussed yet, the upcoming presidential election. The actual election is not for a whole year, but some individuals, senators mainly, have already announced themselves as candidates. Look at the headline and article in yesterday's newspaper (The Gate's Open and They're Off!). Why do you think some of these senators, like the one from our state, have said that they are going to run for President this soon?

Jackie: Because they don't want the President to stay in office any more.

Teacher: A lot of people don't want that, but they aren't running. There is a good reason you haven't thought of yet; anyone else have an idea as to why some people have announced that they are running so soon?

Liv: Maybe people don't know them very well.

Teacher: That is right. They need advance publicity so people will vote for them in the elections held before the big, general election. Heather, do you know what the earlier elections held before the general election are called?

Heather: Primary, I think.

Teacher: Yes, that is right. Class, what do you think will be a major issue in this campaign?

Mike: (Calling out) I think crime will be an issue.

Mary S.: (Calling out) I bet the economy will be one of the major issues in this campaign.

Pete: (Calling out) My mom says that we need a president who will make sure there is never another war.

Teacher: Yes, a candidate's views on war and peace, or foreign policy, are usually a major issue.

John: What do you mean by "issue"?

Teacher: Good question, John. We should clarify what an issue is for everyone. An issue is a topic that people discuss a lot in a campaign because the topic is important to them. Issues are

important to people because there are different viewpoints, or two sides, on an issue. For example, some children just said that the economy, crime, and peace are issues. Remember last week, we discussed that some people believe the way to fix or help our economy is to raise taxes and other people believe the way to this is to lower taxes. The economy is a campaign or political issue because people have different ideas about it. Does anyone have questions about what "issue" means now?

Teacher: We have worked on resource skills a lot lately, how could we find out what the issues are for this upcoming campaign?

Dee: We could look in the library.

Teacher: What resource materials in the library would help use with this?

Heather: We could look at the newspapers and magazines like *Time* and *Newsweek*.

Teacher: Yes, but today we aren't going there because I brought several copies of the latest news magazines and newspapers. As a matter of fact, I have six copies of each. I am going to pass these out to groups, and I would like each group to look at the magazines and newspapers to come up with a list of four to six major issues you think will be discussed in the upcoming presidential campaign. Discuss these issues in your groups. Make sure there are different viewpoints on the topics, otherwise, it is not an issue. You can also come up with issues by discussing some of the things we have been discussing in Current Events during the last few weeks. I have made six groups with the following people in each:

Carol	Christopher	Gabe	Lisa	Minerva	Dave
Mary P.	Emily	Amanda	Jenny	Heather	Kathy
Pete	Lauren	Jackie	Dee	Gwen	Liv
Mary S.	Sonny	Beth	Ike	Julie	Becky
Mike			Eric	John	

It is now 9:15, you will have until 10:00 to work in your groups. Then, you will have a ten minute break before we switch for reading classes.

Training Exercise A

STUDENT ROSTER

Teacher's Name_____ **School** _____

I. Please list students' first names, gender, ethnicity (Caucasian-American, African-American, Asian-American, Hispanic-American, Native-American, Other) in the columns below.
II. Indicate the students who receive free or reduced lunch by placing a check mark (✓) in the subsidized lunch column.
III. In the ability rating column, please provide a general, numerical rating of each student's ability level that corresponds to the following scale: 5=superior, 4=above average, 3=average, 2=below average, 1=low. Please do not spend a great deal of time thinking about this--record your first reaction. This task should not take longer than five minutes.
IV. In the special program column, indicate the students who have been formally identified for a special program (special ed., gifted ed., Chapter I) by naming the program from which they are receiving special services.
V. In the last column, indicate the composite percentile score received by students' on their most recently administered standardized achievement test. Write the name of this test here. ITBS

Students' First Names (Add initial for duplicates.)	Gender	Ethnicity	Subsidized Lunch	Ability Rating	Special Program	Achiev. Percentile
1. Carol	F	Cau.-A		5		99
2. Dee	F	Hisp.-A		3		80
3. Christopher	M	Cau-A		2		42
4. Lisa	F	Cau-A		4		82
5. Gwen	F	Asian-A		3		78
6. Gabe	M	Hisp.-A		4		89
7. Dave	M	Cau.-A		4		93
8. Liv	F	African-A		3		72
9. Mary P.	F	African-A		4		80
10. Emily	F	Cau.-A		4		87
11. Eric	M	Cau.-A	✓	2	EMR	30
12. Amanda	F	Cau.-A		4		99
13. Jenny	F	Cau.-A		4		81
14. Mary S.	F	Cau.-A		3		60
15. Heather	F	Hisp-A	✓	4		87
16. Sonny	M	Hisp.-A		3		81
17. Kathy	F	Cau.-A		1		20
18. John	M	Cau.-A		2		48
19. Beth	F	Cau.-A		3		58
20. Minerva	F	Cau.-A	✓	5		93
21. Pete	M	African-A		4		75
22. Ike	M	Cau.-A		3		70
23. Lauren	F	Cau.-A		4		88
24. Julie	F	Cau.-A	✓	3		71
25. Mike	M	Cau.-A		2	LD	40
26. Becky	F	Cau.-A		3		72
27. Jackie	F	Cau-A	✓	4		86
28.						
29.						
30.						
31.						
32.						
33.						

Classroom Practices Record (CPR)

CPR: Identification Information

Date of Observation _____ Observer _____ Observation No. _____ (in this classroom)

Classroom Teacher_____ School _____

School District _____ City _____ State ____

Grade Level _____ No. of Students in Classroom _____ No. of Girls _____ No. of Boys _____

Target Student #1:
____ Gender (M/F)
____ Limited English Proficient (specify native language, _____)
____ Handicapping Condition (specify, _____)
____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:
- **___ African-American**
- **___ Asian-American /Pacific Islander**
- **___ Hispanic-American**
- **___ Native-American**
- **___ Caucasian-American**
- **___ Other**

Target Student #2:
____ Gender (M/F)
____ Limited English Proficient (specify native language, _____)
____ Handicapping Condition (specify, _____)
____ Economically Disadvantaged (i.e., free or reduced lunch)

Ethnicity:
- **___ African-American**
- **___ Asian-American/Pacific Islander**
- **___ Hispanic-American**
- **___ Native-American**
- **___ Caucasian-American**
- **___ Other**

CPR: Physical Environment Inventory

Learning Centers:

__3 or more learning/interest centers (specify topics, _____ _____ _____)

__2 learning/interest centers (specify topics, _____ _____)

__1 learning/interest center (specify topic, _____)

__No learning/interest centers

Attach the classroom teacher's seating chart. Circle and label Target Student #1 (S#1) and Target Student #2 (S#2).

(CPR Instrument Developed by The University of Connecticut—The National Research Center on the Gifted and Talented)

CPR: Curricular Activities

Activity Codes, i.e., Tchr. Act. involving S#1:
(1) audio visual
(2) demonstration
(3) discussion
(4) explain/lecture
(5) games
(6) non-academic activity
(7) oral reading
(8) project work
(9) review/recitation
(10) silent reading
(11) simulation/role playing
(12) testing
(13) verbal practice or performance
(14) written assignments

Group Size Codes, i.e., Target Student #1 is working:
(1) individually
(2) in a group of 2-6 students
(3) in a group of 7 or more students
(4) with a total class

Group Composition Codes:
(Ht) heterogeneous ability grouping
(Hm) homogeneous ability grouping

Descriptive Notes:
(1) Target Student #1 is involved in advanced content instruction/materials
(2) Target Student #1 is involved in advanced process instruction/materials
(3) Target Student #1 is working on an advanced product or project work
(4) Target Student #1 is working on an independent study project based on assigned topic
(5) Target Student #1 is working on an independent study project based on self-selected topic
(6) Other indications of differentiation experienced by Target Student #1

Miscellaneous Notes: Observer's notes for recording S#2's activity, conducting the teacher interview, or writing the summary report.

Academic Subject: _____

Beg. Time	End. Time	Act.	Grp./Size Code	Grp./Cmp. Code	Codes & Descriptive Notes Code	Misc. Notes of Differentiation

CPR: Verbal Interactions

Who and To Whom Codes:

(T) Teaching adult
(S#1) Target Student #1
(S#2) Target Student #2
(NT) Non-target Student
(AL) Students At-Large

What Codes:

(KC) knowledge/comprehension question
(HOTS) higher-order thinking skills question
(RC) request or command
(ES) explanation or statement

(R) response
(N) no verbal response

Wait Time:

(√) minimum of 3 seconds pre or post response time

Who	To Whom	What	Wait Time	Miscellaneous Notes

Appendix D

Computer Codebook for Observation Data

Computer Codebook for Observation Data

RECORD #1: DEMOGRAPHICS

VARIABLE	COLUMN	NOTES
School District	1-2	
Region	3	NE=1, S=2, W=3, NC=4
Dist. Type	4	Sub=1, Urb=2, Rur=3
Observer	5-6	01 through 17
Obs. No.	7	1 or 2
Grade	8	3 or 4
G/T Program	9	0 or 1
Tot Enrollment	10-11	Class Enrollment
Girls	12-13	Girls in the Class
Boys	14-15	Boys in the Class
S#1 Gender	16	Male=1, Female=2
S#1 Lim. English	17	0 or 1
S#1 Handicapped	18	0 or 1
S#1 Econ. Disadv.	19	0 or 1
S#1 Ethnicity	20	1-5
S#1 Ach. Percentile	21-22	
S#2 Gender	23	
S#2 Lim. English	24	
S#2 Handicapped	25	
S#2 Econ. Disadv.	26	
S#2 Ethnicity	27	
S#2 Ach. Percentile	28-29	
Learning Centers	30	No=0, 1=1, 2=2, 3+=3

RECORD #2: CURRICULAR ACTIVITIES & DIFFERENTIATION

VARIABLE	COLUMN	NOTES
Subject	1	Rdng.=1, LA=2. Math=3 Sci.=4, Soc. St.=5
# of Act.	2	Activities within Subj.
Act.#1 Time	3-5	For activity, not subj.
Act.#1 Act. Code	6-7	
Act.#1 Group Size	8	
Act.#1 Group Comp.	9	Ht.=1, Hm.=2
Differentiation	10	
Act.#2 Time	11-13	
Act.#2 Act. Code	14-15	
Act.#2 Group Size	16	
Act.#2 Group Comp.	17	Ht.=1, Hm.=2
Differentiation	18	
Act.#3 Time	19-21	
Act.#3 Act. Code	22-23	
Act.#3 Group Size	24	
Act.#3 Group Comp.	25	Ht.=1, Hm.=2
Differentiation	26	
Act.#4 Time	27-29	

Computer Codebook continued:

Act.#4 Act. Code	31-31	
Act.#4 Group Size	32	
Act.#4 Group Comp.	33	Ht.=1, Hm.=2
Differentiation	34	
Act.#5 Time	35-37	
Act.#5 Act. Code	38-39	
Act.#5 Group Size	40	
Act.#5 Group Comp.	41	Ht.=1, Hm.=2
Differentiation	42	

RECORD #3: VERBAL INTERACTIONS

VARIABLE	COLUMN	NOTES
Subject	1	1-5
TALKC	2-3	2 digit freq.
TALKCW	4-5	
TALHOT	6-7	
TALHOTW	8-9	
TALRC	10-11	
TALES	12-13	
TS1KC	14-15	
TS2KCW	16-17	
TS1HOT	18-19	
TS1HOTW	20-21	
TS2RC	22-23	
TS2ES	24-25	
TS2KC	26-27	
TS2HOT	28-29	
TS2HOT	30-31	
TS2HOTS	32-33	
TS2RC	34-35	
TS2ES	36-37	
TNTKC	38-39	
TNTKCW	40-41	
TNTHOT	42-43	
TNTHOTW	44-45	
S1TKC	46-47	
S1THOT	48-49	
S1TES	50-51	
S1TR	52-53	
S2TKC	54-55	
S2THOT	56-57	
S2TES	58-59	
S2TR	60-61	

RECORD #'S 4-11:

Repeat of Records 2 and 3, but for all other subject areas.

NRC G/T

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