DOCUMENT RESUME

ED 043 990 EC 030 426

AUTHOR	Steele, Joe Milan: And Others
TITLE	Instructional Climate in Illinois Gifted Classes.
INSTITUTION	Illinois Univ., Urbana. Center for Instructional Research and Curriculum Evaluation.
SPONS AGENCY	Illinois State Office of the Superintendent of Public Instruction, Springfield. Dept. of Program Planning for the Gifted.
PUB DATE	Aug 70
NOTE	62p.
EDRS PRICE	EDRS Price MF-$0.50 HC-$3.20
DESCRIPTORS	Affective Behavior, Class Activities, Classroom Environment, Cognitive Measurement, Demonstration Projects, *Exceptional Child Research, *Gifted, *Program Evaluation, *Questionnaires, Secondary School Students, Student Attitudes
IDENTIFIERS	Class Activities Questionnaire, Illinois

ABSTRACT

In order to evaluate the Illinois program for the gifted, a study was conducted in which the Class Activities Questionnaire (CAQ) was administered to 3,138 students in Reimbursement Gifted Classes, Demonstration Gifted Classes and Average (Non Gifted) Classes (grades 6 through 12). The CAQ, which assesses both the cognitive domain (levels of thinking needed in class activities) and the affective domain (social and emotional conditions existing in the classroom), contained 30 items evaluating the dimensions of lower thought processes, higher thought processes, classroom focus, classroom climate, and student opinions. The CAQ was found to reveal clear variations in emphasis in both cognitive and affective domains. Results showed significant differences between Average and Gifted classes in the degree of emphases on higher thought processes, classroom focus, and classroom climate. Significant differences were also noted between Average and Gifted classes on the statistical factors of application, synthesis, enthusiasm, independence, memory, and test/grade stress. (RD)

INSTRUCTIONAL CLIMATE IN ILLINOIS GIFTED CLASSES

BY

Joe Milan Steele

Ernest R. House

Stephen Lapan

Thomas Kerins

August 1970

Illinois Gifted Program Evaluation
Center for Instructional Research and Curriculum Evaluation
University of Illinois
805 West Pennsylvania Avenue
Urbana, Illinois 61801

INSTRUCTIONAL CLIMATE IN ILLINOIS GIFTED CLASSES

Joe Milan Steele, Ernest R. House, Stephen Lapan,
and Thomas Kerins

Illinois Gifted Program Evaluation
Center for Instructional Research and Curriculum Evaluation
University of Illinois
805 West Pennsylvania Avenue
Urbana, Illinois 61801

Supported by

The Department of Program Development for Gifted Children

OFFICE OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION

Ray Page, Superintendent of Public Instruction

August 1970

OFFICE OF THE SUPERINTENDENT OF PUBLIC INSTRUCTION

Ray Page - Superintendent of Public Instruction

Verne E. Crackel - Deputy Superintendent

John R. O'Neill - Associate Superintendent

Robert D. Cain - Assistant Superintendent
Division of Special Education Services

Herbert Baker - Director
Program Development for Gifted Children

MEMBERS OF THE STATE ADVISORY COUNCIL FOR THE GIFTED

Robert Bauernfeind - Chairman
Professor of Education, Northern Illinois University

Ray Caton
County (McLean) Superintendent of Schools, Bloomington

A. Gordon Dodds
Superintendent, Edwardsville Community Schools, District 7

David M. Jackson
Director of Development, University of Illinois, Chicago

Blair Plimpton
Superintendent of Schools, District 44, Park Ridge

Richard Verduin
Coordinator of Professional Experiences
College of Education, Southern Illinois University

REPORTS OF THE ILLINOIS GIFTED PROGRAM EVALUATION

Report No. 1: Policies of the Illinois Plan for Program Development for Gifted Children, David L. Colton. Center for Educational Field Studies, Washington University, St. Louis, Missouri, August 1968. 125 pages.

Report No. 2: Training Materials for Gifted Evaluation Institute, University of Illinois, July 29-August 9, 1968, designed by Douglas Sjogren with assistance from Robert E. Stake, Ernest R. House, Terry Denny, and Stephen Lapan in cooperation with the Center for Instructional Research and Curriculum Evaluation. Cooperative Educational Research Laboratory, Inc., Northfield, Illinois, August 1968. 178 pages.

Report No. 3: A Preliminary Assessment of the Illinois Gifted Program, Ernest R. House, Stephen Lapan, Thomas Kerins. Cooperative Educational Research Laboratory, Inc., Northfield, Illinois, October 1968. 45 pages.

Report No. 4: The Report on the 1968 Summer Institute on Evaluation, University of Illinois, July 29-August 9, 1968, Raynard Dooley, Ernest R. House, Stephen Lapan, and Thomas Kerins. Cooperative Educational Research Laboratory, Inc., Northfield, Illinois, October 1968. 95 pages.

Report No. 5: The Visibility and Clarity of Demonstrations, and Appendices, (published as a separate volume) Ernest R. House, Thomas Kerins, Stephen Lapan, and Joe M. Steele. Cooperative Educational Research Laboratory, Inc., Northfield, Illinois, May 1969. 80 pages.

Report No. 6: Dimensions of the Class Activities Questionnaire, Joe M. Steele. Center for Instructional Research and Curriculum Evaluation, University of Illinois, Urbana, Illinois, October 1969. 62 pages.

Report No. 7: The Illinois Demonstration Centers--The Visitors' View, Thomas Kerins, Ernest R. House, Stephen Lapan, Joe M. Steele. Center for Instructional Research and Curriculum Evaluation, University of Illinois, Urbana, Illinois, October 1969. 62 pages.

Report No. 8: After the Visit: The Impact of Demonstration, Thomas Kerins, Ernest R. House, Stephen Lapan, Joe M. Steele. Center for Instructional Research and Curriculum Evaluation, University of Illinois, Urbana, Illinois, May 1970. 38 pages.

Report No. 9: Instructional Climate in Illinois Gifted Classes, Joe Milan Steele, Ernest R. House, Stephen Lapan, Thomas Kerins. Center for Instructional Research and Curriculum Evaluation, University of Illinois, Urbana, Illinois, August 1970.

TABLE OF CONTENTS

MAIN TEXT

TABLE OF CONTENTS (Continued)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

INSTRUCTIONAL CLIMATE IN ILLINOIS GIFTED CLASSES

DIMENSIONS FOR COMPARISON

Background

Since 1963 the State of Illinois has funded one of the largest and most comprehensive gifted programs in the country. The Office of the Superintendent of Public Instruction has administered the program in five sections: reimbursement, which provides school districts with money on a formula basis to operate a program for students identified as gifted; demonstration, which provides extra money for districts to demonstrate selected programs; training, which provides funds to train teachers, usually in summer institutes; and experimental, which supports applied research, development, and evaluation in the area of the gifted. A state staff of 13 oversees the entire program.

Currently, there are about 400 reimbursement districts, 23 demonstration centers, 7 experimental projects, and 5 training institutes. Funding is $4 million a year. The variety of different projects is very great indeed, ranging from music and creativity programs to Individually Prescribed Instruction and team teaching to "new curricula" and pre-school programs. Each district is allowed to define "gifted" as it so chooses, although some guidelines are provided.[1]

Diversity is a major element of the Illinois Gifted Program. Classes for the gifted in Illinois schools range across all grade levels from first to twelfth grade. They occur in a variety of instructional settings from independent study to group discussions to student-led classes. They are held in conventional classrooms, laboratories, resource centers, and other settings in districts ranging in size from several hundred students to thousands of students.

---

[1]House, Ernest R., Joe M. Steele, Stephen Lapan, Thomas Kerins, "Early Findings on the Illinois Gifted Program," TAG Gifted Children Newsletter, vol. XII, no. 2, March 1970.

One of the virtues of the Illinois Plan for Program Development for Gifted Children has been the opportunity for richness and diversity provided by allowing each district to define its own gifted population. The recognition of many dimensions of talent and giftedness has resulted in the development of local programs oriented to the particular interests of local districts. This has allowed school districts representing widely different communities to participate in enriching their programs, rather than defining "gifted" narrowly and catering to a single elite group.

The Problem of Judging Success

The very diversity of gifted programs makes the problem of evaluating their success extremely difficult. The programs are not directly comparable. No measure or battery of instruments exist to measure student outcomes from these programs in any meaningful way. Such traditional measures as achievement tests, grades, etc., simply are not able to reveal the effects of a program. In addition, comparison of such scores across many districts is entirely inappropriate.[2]

Another problem which further confounds the issue is the wide range of differences that exist among school districts themselves. For some schools the addition of programs for the gifted is simply an extension of an already existing rationale and set of provisions for able students. In other schools a modest innovation in content or teaching method represents a major change which stands in conflict with the traditions and practices of most teachers in the district. Innovation is relative: a particular program may be seen as old

[2]The most appropriate use of such data is to establish local norms and study gains and relative performance from year to year, selecting the most apt battery of tests for particular conditions and ends sought.

hat in one district and anathema in another. *It would be a mistake to judge progress in program development solely on the basis of a description of the innovation. Progress involves how far one has gone and what direction one is going as well as the vehicle being used.*

Domains for Comparison

The search for common denominators to make unlike programs comparable had led to the exploration and development of means for assessing two promising domains:

1) The Cognitive Domain -- levels of thinking called for in class activities;
2) The Affective Domain -- social and emotional conditions that exist in the classroom.

The domains of instructional climate would seem to occur in all classes regardless of grade level or subject matter. Thus they would enable at least rudimentary comparisons of a wide variety of classes. They seem especially appropriate in assessing gifted programs. One would expect to find higher thought process emphasized in gifted classes. Because of the emphasis in training and rationale of the Illinois Gifted Program, one would also expect to find positive social and emotional conditions prevailing in gifted classes.

Cognitive Domain

One domain that acts as a common denominator for school programs is the cognitive behaviors students are called on to perform. While the goals and content of programs are diverse, only a limited number of thinking operations are believed to exist by theorists in the psychology of intelligence. Different thinking operations are required by various kinds of class activities. By identifying the activities emphasized in a particular class one can infer the cognitive levels stressed in that class.

One of the most strongly supported systems for classification of thinking operations is that developed by Bloom and his colleagues.[3] This system of classification has been simplified and developed into an evaluation procedure by Steele.[4,5]

The Taxonomy as adapted contains seven levels of thinking operations. These levels are arranged in order of increasing complexity. They are hierarchical: each higher thinking operation involves the use of the lower levels The seven cognitive operations and a brief description of activities which imply their use are shown in Figure 1.

FIGURE 1

COGNITIVE OPERATIONS ASSESSED BY THE CLASS ACTIVITIES QUESTIONNAIRE

COGNITIVE OPERATIONS		BRIEF DESCRIPTIONS (Items not shown)
LOWER THOUGHT PROCESSES	1. Memory:	Activities calling for recall or recognition of information presented.
	2. Translation:	Activities calling for paraphrasing or expressing information in a different symbolic form.
	3. Interpretation:	Activities calling for recognition of relationships and seeing implications of information.
HIGHER THOUGHT PROCESSES	4. Application:	Activities calling for selection of appropriate methods and performance of operations required by problem situations.
	5. Analysis:	Activities calling for recognition of the structure of material, including the conditions that affect the way it fits together.
	6. Synthesis:	Activities calling for the generation of new ideas and solutions.
	7. Evaluation:	Activities calling for development and application of a set of standards for judging worth.

[3]Bloom, Benjamin S., et al. Taxonomy of Educational Objectives: Cognitive Domain, New York: David McKay Co., 1956.

[4]Steele, Joe M. Things As They Are: An Evaluation Procedure to Assess Intent and Practice in Instruction. Unpublished doctoral dissertation, Urbana: University of Illinois, 1969.

[5]Steele, Joe M. Dimensions of the Class Activities Questionnaire. (Multilithed), Urbana: Illinois Gifted Program Evaluation, October 1969.

These seven levels are felt to include most student behaviors related to thinking operations. Note that they are divided into Lower and Higher Thought Processes. This is in accord with the Bloom framework and has received strong support in validation studies. The difference between lower and higher levels is one of complexity. It should be remembered that the use of all the lower levels is involved at each higher level of thinking. Also, it should be apparent that there can be a range of difficulty of activities at each level of thinking. (See Appendix A for a more detailed description of each level.)

Based on these cognitive levels, an instrument was developed to assess which levels of thinking are emphasized in the classroom. This instrument, the Class Activities Questionnaire (CAQ) will be described in a latter section of this report.

Affective Domain

Another domain which allows comparisons of diverse programs is an assessment of the social and emotional conditions that exist in the classroom. Many factors contribute to a positive classroom climate or to conditions which are unhealthy and detrimental to learning. Some of these are the process factors -- the way the group and teacher interact and work together, group norms, teaching strategies, and the way roles become defined for all participants in the teaching-learning process. Other factors have to do with individual and group attitudes and feelings: trust and cooperation, warmth and enthusiasm, acceptance and involvement. Still other factors have to do with what goals are espoused and how clearly they are understood -- what the students and teacher think the class is for. All of these groups of factors affect the students' motivation and attitude toward learning.

The nine factors selected to assess the Affective Domain and a brief description of each are shown in Figure 2.

FIGURE 2

AFFECTIVE CLASSROOM CONDITIONS ASSESSED BY THE CLASS ACTIVITIES QUESTIONNAIRE

AFFECTIVE		BRIEF DESCRIPTIONS (Items not shown)
CLASSROOM FOCUS	1. Discussion:	Student opportunity for and involvement in class discussion.
	2. Test/Grade Stress:	High pressure to produce teacher-selected answers for a grade.
	3. Lecture:	Teacher role is information-giver with a passive listening role for students.
CLASSROOM CLIMATE	4. Enthusiasm:	Student excitement and involvement in class activities.
	5. Independence:	Tolerance for and encouragement of student initiative.
	6. Divergence:	Tolerance for and encouragement of many solutions to problems.
	7. Humor:	Allowance for joking and laughter in the classroom.
	8. Teacher Talk:	Proportion of class time consumed by teacher talk.
	9. Homework:	Weekly amount of outside preparation for class.

The Classroom Focus dimension assesses whether focus is on the teacher as information-giver with students having a passive role, or on the students being given an active role with the teacher being a facilitator. The Classroom Climate dimension deals with factors such as how relaxed and open the class is.

These classroom conditions were carefully selected to reflect changes allowing the student to play a more active role than usually occurs in traditional classes. This "freeing up" of the classroom generally results in greater student involvement and enthusiasm, more self-initiated and independent learning. In contrast, conditions in average classrooms are all too often characterized by dominance by the teacher and a passive, listening role for students. Many times there is too much pressure to perform, emphasis on only one right answer to problems, and little tolerance for ideas not presented by the text or teacher. Such conditions are obviously not conducive to critical thinking, or to the assumption of individual responsibility by the student.

Based on these factors a second instrument was developed to assess classroom conditions. The Class Activities Questionnaire combines the instruments for the cognitive and affective domains to assess four major Dimensions of instructional climate. (A fifth Dimension, Student Opinions, is not reported in this study.) Each of these Dimensions is composed of a number of Factors which in turn are represented by pairs of items in the questionnaire. These sixteen factors (7 cognitive and 9 noncognitive) yield a revealing profile of the instructional climate in the classroom.

The Problem of Observation

The first chapter described the selection of dimensions of instruction which seem to be meaningful, comparable, and relevant to the education of the gifted. The next problem which required resolution was one of gathering data from actual classrooms regarding those dimensions. Since instruments for measuring student growth in these dimensions across diverse programs do not exist, we chose to look at classroom transactions to see what mental and emotional demands are made upon students.

The data collection procedure needed to be accurate in describing class instruction over time, yet efficient and economically feasible. It was judged that the most accurate estimate of cognitive emphasis and a positive learning environment could be obtained using sensitive and perceptive observers in the class frequently, trained in using systematic procedures to collect the data. This procedure is too costly. The training, time, and support demands prohibit its use. (Not to mention the difficulty of locating qualified personnel willing to do this somewhat unrewarding job.) However, two sources of untrained observers exist in any classroom: the teacher and the students. Some evidence indicates that students' observations provide an accurate picture of the class environment and they can be collected efficiently.

Description of the Instrument

The Class Activities Questionnaire (CAQ) is a 30 item instrument administered to both teacher and students. (See Appendix B for a copy of the instrument.) The first 27 items are statements describing general kinds of activities which are strongly emphasized in the classroom. These activities imply either levels of thinking or classroom conditions. Figure 3 shows the Structure of the CAQ.

FIGURE 3

STRUCTURE OF THE CLASS ACTIVITIES QUESTIONNAIRE (CAQ)

The CAQ assesses five major Dimensions of instructional climate, as noted in the left-hand column. Each of these dimensions is composed of a number of Factors which in turn are usually represented by several items in the questionnaire. (The Cognitive Dimensions are based on Bloom's Taxonomy.)

DIMENSIONS	FACTORS	BRIEF DESCRIPTIONS (Items not shown)
LOWER THOUGHT PROCESSES	1. Memory:	Activities calling for recall or recognition of information presented.
	2. Translation:	Activities calling for paraphrasing or expressing information in a different symbolic form.
	3. Interpretation:	Activities calling for recognition of relationships and seeing implications of information.
HIGHER THOUGHT PROCESSES	4. Application:	Activities calling for selection of appropriate methods and performance of operations required by problem situations.
	5. Analysis:	Activities calling for recognition of the structure of material, including the conditions that affect the way it fits together.
	6. Synthesis:	Activities calling for the generation of new ideas and solutions.
	7. Evaluation:	Activities calling for development and application of a set of standards for judging worth.
CLASSROOM FOCUS	8. Discussion:	Student opportunity for and involvement in class discussion.
	9. Test/Grade Stress:	High pressure to produce teacher-selected answers for a grade.
	10. Lecture:	Teacher role is information-giver with a passive, listening role for students.
CLASSROOM CLIMATE	11. Enthusiasm:	Student excitement and involvement in class activities.
	12. Independence:	Tolerance for and encouragement of student initiative.
	13. Divergence:	Tolerance for and encouragement of many solutions to problems.
	14. Humor:	Allowance for joking and laughter in the classroom.
	15. Teacher Talk:	Proportion of class time consumed by teacher talk.
	16. Homework:	Weekly amount of outside preparation for class.
STUDENT OPINIONS	17. Qualities:	Students' view of the best things about the class.
	18. Deficiencies:	Students' view of things that need changing about the class.

Each student judges how accurately each statement describes his class. (The response scale is Strongly Agree, Agree, Disagree, Strongly Disagree.) Agreement (or disagreement) by a majority of the class indicates activities which are characteristic of the class.

The last three items on the CAQ call for open-ended responses on the best things about the class and things needing to be changed from the rater's point of view. Opportunity for comments of any kind is also provided. These last items essentially represent course-specific details which supplement the information which can be processed using group scores. (This section of the CAQ is not reported in this study.)

Accuracy of Observation

The teacher would be a poor source from which to obtain information about actual emphases occurring. When a person tries to do something and observe what he does at the same time, his observations are often inaccurate. Many studies have shown the difficulty of being objective and avoiding bias in rating oneself. However, the teacher is the most direct source from which to obtain data on what is intended to be emphasized. It is for this purpose that the teacher is asked to respond to the CAQ.

Students are in a much better position to report on the emphasis actually given to various class activities. Not every student is an accurate observer. However, it is possible to process student judgments as a group so that errors in observation are minimized. Moreover, the nature of the instructional climate depends in part on the way it is perceived by the students themselves.

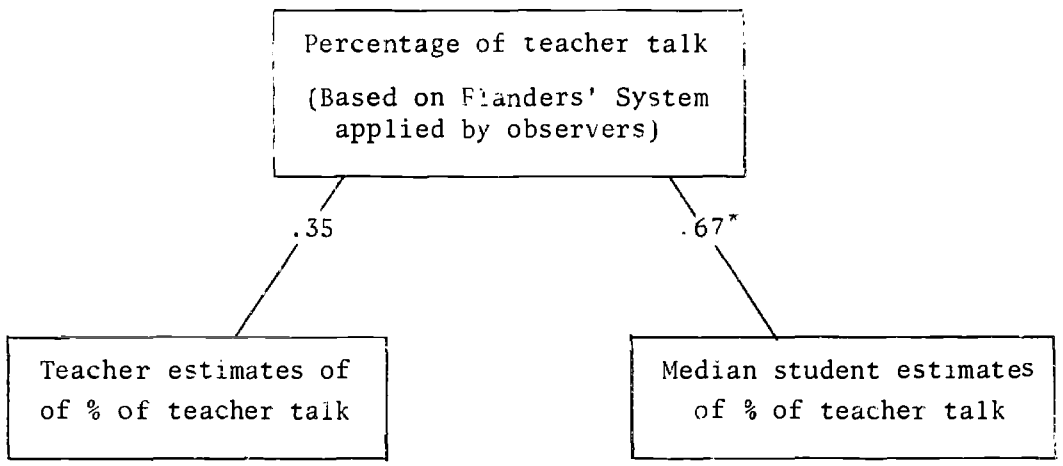
An example of the accuracy of student perceptions is seen in responses to item 26 on the CAQ: "On the average, the teacher talks how much of the time?" A study was conducted in 32 classes comparing the teacher's and median student estimates to the actual percentage of teacher talk recorded by an observer using Flanders system of classifying verbal interaction.

Figure 4 shows that the median student estimate is quite closely related to the actual amount of talk. The teachers' estimates were much less accurate and were frequently much lower than they actually talked.

FIGURE 4

ACCURACY OF OBSERVATION OF THE TEACHER AND STUDENTS AS A GROUP

(Correlations are based on results from 32 classrooms.)



*Value significant at the .01 level of confidence. The other value does not reach the .05 level.

To further insure that an accurate picture of the class was being obtained, a system of consensus scoring was utilized rather than using simple mean or median scores (This scoring procedure is fully described in Dimensions of the Class Activities Questionnaire and Structure of the CAQ.)

Briefly, each of the first 16 factors shown in Figure 3 is scored as receiving emphasis in a class only if the following conditions are met:

1) Consistency of Response: All Cognitive and Classroom Focus factors on the CAQ are composed of pairs of items describing class activities. Two-thirds of the class must be consistent in their answers to both members of each pair to score that factor as emphasized.

2) Direction of Response: Half the class or more must hold the same opinion about a factor for it to be scored as a characteristic of the class.

3) Strength of Response: If factors are seen as characteristic of the class, they are scored as receiving Some or Much emphasis depending on how strongly the students as a group agreed with the items. A factor is scored as receiving No emphasis, if students as a group disagreed with the items. Such a score says in effect that a factor was de-emphasized or clearly not characteristic of the class.

4) Inconclusive Responses: When the criteria above are not satisfied for any factor, it is simply scored Inconclusive. Such a classification could be due to any number of things: inconsistent emphasis, irrelevance of the items to the course, differential treatment of some in the class, etc. An inconsistent score on a factor does mean that for students as a group the factor was not clearly seen as emphasized or de-emphasized.

5) The median student estimate is used for factors 15 and 16.

How CAQ Results Are Reported and Compared

Figure 5 shows both the Actual (A) emphasis and the teacher's Intended (I) cognitive emphasis in one gifted class. A variety of activities were utilized resulting in emphasis on four levels of thinking. Higher thought processes received the most attention, particularly "Analysis." Three of the four levels intended were actually emphasized, although not always to the degree desired. Of the lower thought processes, this teacher gave some emphasis to "Translation" although he intended none. There is no clear evidence of emphasis on "Interpretation" which he wished to stress.

FIGURE 5

COMPARISON OF INTENDED AND ACTUAL COGNITIVE EMPHASIS IN INSTRUCTION

(Based on actual data for one gifted class.)

Levels of Thinking			Actual (A) and Intended (I) Emphasis			
			Inconclusive	None	Some	Much
LOWER LEVEL THOUGHT PROCESSES	Memory	1	A	(I)		
	Translation	2		(I)	A	
	Interpretation	3	A		(I)	
HIGHER LEVEL THOUGHT PROCESSES	Application	4			A	(I)
	Analysis	5			(I)	A
	Synthesis	6			A (I)	
	Evaluation	7	A (I)			

There are two ways of analyzing the information the CAQ provides. First, one can determine whether the teacher is accomplishing what he set out to do. This reveals the successful implementation of a classroom program. Second, a judgment can be made about the appropriateness of the profile of emphasis. The balance of emphasis across the seven cognitive levels depends upon the nature of the program and the instructor's purposes. However, emphasis on only one level or total emphasis on only lower level thinking abilities suggests an inappropriate design for gifted programs. Emphasis on several levels including both lower and higher thought processes is judged by the evaluation staff to be most appropriate.

Figure 6 illustrates the information on Affective Classroom Conditions provided by the CAQ.

FIGURE 6

COMPARISON OF INTENDED AND ACTUAL AFFECTIVE CONDITIONS EMPHASIZED IN THE CLASSROOM

(Based on actual data for one gifted class.)

	Affective Classroom Conditions		Actual (A) and Intended (I) Emphasis			
			Inconclusive	None	Some	Much
CLASSROOM FOCUS	Discussion Opportunity	8				A (I)
	Test/Grade Stress	9	A (I)			
	Lecture	10	A	(I)		
CLASSROOM CLIMATE	Enthusiasm	11				A (I)
	Independence	12	A			(I)
	Divergence	13				A (I)
	Humor	14				A (I)

		Student Estimate	Teacher Estimate
Percent of Teacher Talk	15	60%	75%
Preparation Time Per Week	16	3 hours	no estimate obtained

This figure shows the same gifted class used to illustrate Figure 5. In emphasizing four levels of thinking, this teacher provided much discussion opportunity. A great deal of enthusiasm was generated. There was considerable opportunity for divergent ideas to be generated (but independence in work was not clearly supported). The climate appears to include humor and be open and relaxed, with no apparent stress on tests and grades. Yet students do spend much time on homework (factor 16, preparation time outside of class). The teacher remains a central figure in the class, talking about 60% of the time.

Again, the comparison can be made between what the teacher intended and what he achieved in practice. Figure 6 also indicates that the teacher did intend all four of the affective conditions that were present in his class. In

addition, however, he intended to allow much opportunity for independence but this emphasis was not apparent in the class. He may be surprised to learn that he is seen as talking less than he thinks he does in class.

These results for each class can be summarized for groups of classes to discover dimensions of emphasis characteristic of a school or special group, such as gifted classes.

Summary scores can also be obtained for each class on the four dimensions of 1) Lower Thought Processes, 2) Higher Thought Processes, 3) Classroom Focus, and 4) Classroom Climate. The differences between groups can then be studied using appropriate statistical tests such as Analysis of Variance and t-tests.

Populations Studied

A perplexing problem in assessing large-scale social action programs has been that a program may not actually be in operation within a local district simply because the district is receiving money for support of the program. In fact, Cohen (1970) contends that this lack of program delivery has invalidated most Title I evaluation results.[6] In other words, one cannot assume the existence of a treatment merely because a district is nominally involved.

In the collection of this data considerable care was taken not to assume a developed program where there was none. After drawing a stratified random sample, interviewers were sent into the districts to interview the program director for two hours, two teachers for an hour a piece, and two students for one-half hour, all with structured interview schedules. Only where it was determined that a program was operational in the classroom was the CAQ administered.

---

[6]Cohen, David K. "Politics and Research: Evaluation of Social Action Programs in Education." Review of Educational Research: Educational Evaluation, vol. 40, no. 2, April 1970.

In 18% of the districts it was found that no program existed in any form.

This rigorous sampling technique was employed only with Reimbursement classes -- classes in districts receiving money from the state on a per capita basis to develop a program for gifted children. In the Demonstration classes -- special classes selected by state staff members for display to surrounding districts -- it was assumed that a program existed. The Average classes were chosen with less care -- mainly in middle-class suburban school districts.

Three school populations were sampled in this study: Reimbursement Gifted Classes, Demonstration Gifted Classes, and Average (Non-Gifted) Classes. The unit of analysis is the classroom group. The Class Activities Questionnaire was administered between January and June 1969 and 1970 to 131 classroom groups in 31 school districts. Grade levels ranged from grade 6 to 12. Reported in this study are classes in the four general subject areas of Language Arts, Social Studies, Science, and Mathematics. The 41 male and 52 female teachers varied in age, training, and teaching experience. They were assured that their identity would not be disclosed in reporting the results. The 3138 students responded anonymously during one of their regularly scheduled class periods.

Reimbursement Classes: 28 classes in 18 school districts; 631 students and 31 teachers (including three team teaching situations). A stratified random sample of 10% of all school districts participating in reimbursed gifted program development projects for over one year was drawn. The sample was stratified by both district size and administrative unit (elementary -- K-8, high school -- 9-12, unit -- K-12). It is believed to be representative of the over 400 Reimbursed Gifted Program Development Projects in Illinois. For purposes of comparison, the sample as reported here excludes 3 classes of Music, Dramatics and Vocational Guidance as well as 2 classes which had no gifted program and were not composed of gifted students. All data were collected in Spring 1969.

Demonstration Classes: 34 classes in 10 school districts; 893 students and 33 teachers. In the 21 school districts which had been demonstrating exemplary programs for the gifted for more than one year, all demonstration classes in grades 6, 7, and 8 were administered the Class Activities Questionnaire. This sample included half of the demonstration centers in the state. The sample reported here excludes five classes in which the Class Activities Questionnaire was incorrectly administered. All data were collected in Spring 1969.

Average Classes: 69 classes in three school districts; 1612 students and 29 teachers. The sample of average classes does not purport to be representative of all non-gifted classes in all settings. The sample was drawn from three suburban communities near Chicago. These communities are almost all-white, middle class settings, average to above-average socio-economically, and characterized by the terms conservative, economically oriented, ambitious for children, and settled (home owners). Data for this sample were collected from two schools in Spring 1969 and from the third school in Spring 1970. Analysis of Variance showed no significant differences in responses from the three schools.

Statistical Analysis

A principle component factor analysis of items 1-25 of the CAQ was conducted. Varimax rotation produced ten factors accounting for 62% of the variance in the sample studied (N = 2071). The statistical factors provide substantial support for the logical construction of the instrument. Table 2 shows the relationship of the statistical factors to the theoretical structure. Eight of the ten logically paired items remained intact in the factor analysis. The two items in the Evaluation factor fell out as two independent factors. Item 21 in the Translation factor also has a low loading with Analysis

FIGURE 7

RELATIONSHIP OF THE STATISTICAL AND LOGICAL FACTORS OF THE CAQ

Statistical Factor Analysis	Logical Factors and Paired Items (Factor loadings and key words in item shown)
	COGNITIVE ITEMS
	1. Memory
Factor 2	1. (.53) Remember and recognize
Factor 2	10. (.73) Memorize
	2. Translation
Factor 7	9. (-.80) Restate ideas
Factor 7	21. (-.45) Explain and summarize
Factor 5	21. (.43) Explain and summarize
	3. Interpretation
Factor 3	6. (-.71) See implications
Factor 3	16. (-.80) Find trends and consequences
	4. Application
Factor 1	3. (.56) Put methods and ideas to use
Factor 1	13. (.45) Practice methods to solve problems
	5. Analysis
Factor 5	7. (.73) Logical reasoning and analysis
Factor 5	12. (.72) Think through complicated problems
	6. Synthesis
Factor 1	11. (.64) Produce something new
Factor 1	23. (.71) Invent, design, compose, create
	7. Evaluation
Factor 9	2. (.83) Make judgments and explain why
Factor 10	20. (.69) Judge the value of ideas
	AFFECTIVE ITEMS
	8. Discussion
Factor 4	5. (-.78) Actively participate
Factor 4	15. (.69) Opportunity to participate
	9. Test/Grade Stress
Factor 2	8. (.64) Know the one best answer
Factor 2	22. (.64) Great concern for grades
	10. Lecture
Factor 8	4. (.93) Do other things than listen in class
	26. (Not incl. in Factor Analysis) Teacher Talk
	11. Enthusiasm
Factor 4	19. (-.65) Excitement and involvement
	19. (.43) Excitement and involvement
Factor 1	12. Independence
	14. (.57) Independently explore and begin new activities
	13. Divergence
	17. Discover many solutions
	14. Humor
Factor 6	25. (.96) Jokes or laughter in class
	15. Teacher Talk
	26. (not included in analysis)
	16. Homework
	27. (not included in analysis)

(Items 18 and 24 were dropped in final stages of field testing, but not deleted from the form of the instrument used in data collection.)

The cognitive domain received strongest support. In relation to the Lower Thought Processes, the classroom focus category "Test/Grade Stress" is seen to be associated with the cognitive factor Memory.

Of the four higher thought processes, two (Analysis and Evaluation) are shown to be discrete and two (Application and Synthesis) are seen as related. The latter are also associated with the two classroom climate categories Enthusiasm and Independence. Each of the two items composing the Evaluation factor are seen to be discrete statistical factors and are related to none of the other items. As they are both relevant for and clearly pertain to evaluation, this finding does not invalidate the pairing of these items, although it does indicate they are not equivalent in meaning.

This analysis suggests that thought processes, classroom focus, and classroom climate are not entirely independent of one another. It is appropriate that the logical dimensions of Memory and Test/Grade Stress are related. It is also reasonable to find a relationship between cognitive levels of Application and Synthesis coupled with the noncognitive factors of enthusiasm and opportunity for independent exploration. One of the four logical factors represented by single items on the questionnaire, Divergence, did not load on any of the statistical factors. This would suggest that it does not assess a discrete characteristic of the class.

Reliability

By most methods, reliability is a function of a wide distribution of scores, yet the nature of the CAQ operates to produce a low variance in a distribution of scores within a given classroom group. Reliability

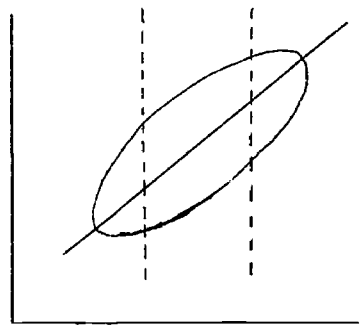
coefficients obtained using traditional techniques would be spuriously low.[7] Thus, it is not appropriate to estimate reliability according to the correlational methods ordinarily used for test analysis. It must be remembered that the unit of analysis is the classroom group; that is, certain characteristics of the classroom observed by students. The reliability statistic involved here informs of the stability of the instrument itself -- its objectivity as an observational technique. Students are expected to agree about the various characteristics; thus, the variance within classes is error variance. As the reliability statistic reflects the ratio of total variance to true variance, if the within class distribution of responses varies more than the distribution of all class means, the reliability of the instrument can be questionned.

In this study the Horst formula[8] for estimating reliability from the within class and between class variances is used. Winer treats the same problem and derives essentially the same solution.[9]

Table 1 shows these reliability estimates for each of the four major dimensions of the CAQ. The obtained reliability coefficients are considered quite satisfactory.

---

[7]The effect of a low variance of response can be seen by looking at the pattern produced when scores are plotted on a graph. The oval represents a pattern of scores indicating high correlation: the scores pattern in a clearly defined direction indicated by the solid line drawn through the oval. The dotted lines indicate the effect on this pattern of a narrow distribution of scores: the ends of the distribution are cut off, greatly reducing the magnitude of the correlation.



[8]$r = \frac{\text{MS Between - MS Within}}{\text{MS Between}}$ Horst, P. A generalized expression for the reliability of measures. Psychometrica, 1949, 14, 21-31.

[9]Winer, B. J. Statistical Principles in Experimental Design. New York: McGraw Hill, 1962, p. 126.

TABLE 1

RELIABILITY INDICES FOR THE FOUR SUBSCORES OF THE CAQ

(N = 131 classes; 3138 students)

	CAQ Dimensions	# Items Summed	Reliability
Subscore I	Lower Thought Processes	6	.76
Subscore II	Higher Thought Processes	8	.85
Subscore III	Classroom Focus	6	.88
Subscore IV	Classroom Climate	4	.86

A second concern regarding the reliability of the instrument has to do with the stability of group responses over time. If the instrument is assessing characteristics of the class that are general enough to be seen as patterns of emphasis over many weeks, then a test-retest reliability coefficient should reflect such stability. This is not to assume that patterns of emphasis are static, but some stability must obtain for an analysis of instructional climate to be meaningful.

A pilot study has been conducted to explore the stability of response over time. Six classes not included in the samples studied in this report were administered the CAQ in late May 1970 and the same form was readministered two weeks later, one week before the end of the school year. Students were not told they would be answering the questionnaire a second time and teachers were not shown the CAQ until the second administration. It was found that the classes included in this pilot study were not typical classes, being quite small and conducted partially in an independent study mode. For this reason, the CAQ was not entirely appropriate as it depends upon a class operating as a group; students may have been responding somewhat arbitrarily to items irrelevant

to their situation. The results of this pilot study are thus considered quite tentative. Table 2 shows the test-retest reliability coefficients for each of the four major dimensions of the CAQ.

TABLE 2

PILOT STUDY RESULTS ON THE STABILITY OF CLASS RESPONSES

(Based on test-retest subscore means for six classes, total N=79; Group sizes ranged from 10 to 18.)

Subscore 1: Lower Thought Processes	Subscore 2: Higher Thought Processes	Subscore 3: Classroom Focus	Subscore 4: Classroom Climate
.67	.91	.59	.89

A more extensive study needs to be made, but these results suggest reasonably stable perception of instructional climate characteristics. Group processing of student judgments appears to be a reliable source of information about the classroom.

A similar application of the Horst formula can be used to estimate the reliability of the sixteen individual factors composing the profile of instructional climate. Table 3 shows reliability estimates for each of the sixteen factors of the CAQ.

TABLE 3

RELIABILITY INDICES FOR EACH OF THE SIXTEEN FACTORS OF THE CAQ

(N = 131 classes; 3138 students)

Dimension		CAQ Factors	Reliability
LOWER THOUGHT PROCESSES	1.	Memory	.88
	2.	Translation	.65
	3.	Interpretation	.86
HIGHER THOUGHT PROCESSES	4.	Application	.83
	5.	Analysis	.78
	6.	Synthesis	.89
	7.	Evaluation	.71
CLASSROOM FOCUS	8.	Discussion	.58
	9.	Test/Grade Stress	.89
	10.	Lecture	.82
CLASSROOM CLIMATE	11.	Enthusiasm	.91
	12.	Independence	.85
	13.	Divergence	.70
	14.	Humor	.86
	15.	Teacher Talk	.94
	16.	Weekly Preparation Time	.87

Each of the first ten factors shown in Table 3 is represented by two items on the questionnaire; the remaining six factors are based on individual items. As can be noted, reliabilities are at acceptable levels, with eleven of the sixteen factors showing values above .80. One factor, Discussion, has an obtained reliability of .58 suggesting that it is somewhat less stable than the rest of the instrument.

Validity

Evidence tending to validate the dimensions of the CAQ must be accumulated over an extended period of time. Some information is available.

An extensive amount of information including student, teacher, and director interviews, classroom observation, and tests are available for 28 classes in which the CAQ was administered. Preliminary analysis of this data suggests that the profiles of emphasis indicated by the CAQ are in fact the primary emphasis that exists in those classes. No contradictory information has been found that would tend to invalidate the CAQ findings. A more extensive analysis of this data will provide much information concerning the validity of the instrument.

Several factors are less strongly supported than others. Memory, the lowest cognitive level, appears to be tapping rote memorization more than recognition and recall. Business education and foreign language classes show much emphasis on this factor, but the degree of emphasis in the samples reported here is much lower than other evidence would suggest. In addition, since this operation is so pervasive in all classes in the schools it may be difficult to obtain an accurate reading on the degree of emphasis.

As specific classroom cases are analyzed, it will become possible to interpret more specifically what emphasis on a particular factor means in terms of actual activities that occur. There is some evidence to suggest that some subject areas have rather consistent patterns of emphasis that characterize them as they are presently taught. The degree to which the course content constrains the kind of emphasis possible and the ability of a teacher to alter patterns of emphasis will determine to a great extent the ultimate meaningfulness of the instrument.

Synthesis, the second highest cognitive level, appears to be tapping activities which deal more with process than with product. The act of going

through the motions neither implies that the student is generating new ideas nor that a new "product" results from the effort. The activities occurring in classes where this factor is seen as emphasized may encourage creative thinking but seem to imply a less rigorous process than Bloom's category entails. The relationship with the Application category shown by the factor analysis also suggests that these items deal with cognitive operations less complex than Synthesis.

The logically related Classroom Climate factor, Divergence, did not load with Synthesis in the factor analysis. In fact, it did not load on any of the statistically derived factors. This factor is assessed by one item: "Students are encouraged to discover as many solutions to problems as possible." It is difficult to believe that tolerance for and encouragement of many answers is a characteristic of most classrooms, as student responses in all groups indicate. Here again it may be that the degree of emphasis is difficult to assess due to the pervasiveness of control and conformity both in society at large and in the classroom. The identification of the variety and range of divergent responses would seem to be in order to clarify the nature of this characteristic.

Continuing Studies

A replication study of the CAQ and the statistical factors it contains has recently been conducted at the Ontario Institute for Studies in Education.[10] Using a normal rather than gifted population, 82 English and Science classes in grades 9-12 were studied (N = 1831). This study has supplied factorial validation

[10]Wahlstrom, M.W. Factorial Validation of the Class Activities Questionnaire. Unpublished paper submitted for presentation at the 1971 Annual Meeting of the American Educational Research Association.

of the instrument: the cognitive and behavioral dimensions of the CAQ were confirmed. Further analysis of this data by grade and subject area is continuing.

A study of California gifted students in homogeneous and heterogeneous groups was recently completed.[11] In this study it was possible to compare the perceptions of average and gifted students to the same classroom setting. It was found that the perceptions of gifted students do not differ from those of their less gifted peers.

Summary

The Class Activities Questionnaire has been found to reveal clear-cut variations in emphasis in both cognitive and affective domains. Statistical analysis supports the dimensions of the instrument. Reliability and stability of group judgments are satisfactory. The processing of student judgments appears to supply an accurate and meaningful description of the instructional climate of the classroom.

---

[11]Hession, Mary Ann. A Study of Cognitive, Behavioral, and Affective Activities in the Classrooms of Gifted Secondary Students. Unpublished Masters Thesis. Los Angeles: University of Southern California, July 1970.

Comparisons Between Gifted and Average Classes

How do gifted classes in Demonstration Centers and Reimbursement Projects differ from average classes (classes not designated as honors or gifted)? To determine whether differences exist there three groups of classes were compared on summary subscores based on the four major dimensions of the CAQ:

1) Lower Thought Processes
2) Higher Thought Processes
3) Classroom Focus
4) Classroom Climate

Table 4 shows the differences revealed by this comparison.[12] Both Reimbursement and Demonstration gifted classes place significantly more emphasis on higher thought processes, classroom focus, and classroom climate. The degree of emphasis given by average classes on these three dimensions is very low. The two groups of gifted classes differed only in the degree to which they emphasized positive classroom focus -- active student involvement in class activities with reduced pressure on tests and grades. Demonstration classes had significantly more positive conditions in this dimension than either Reimbursement or Average classes. In fact the degree of positive emphasis in the latter two is low, with the trend in Average classes being toward a negative classroom focus -- the teacher lecturing and being the central figure with little student discussion and much test/grade pressure.

[12]See Appendix C for analysis of variance and t-test tables.

TABLE 4

DIFFERENCES IN INSTRUCTIONAL CLIMATE IN GIFTED AND NON-GIFTED CLASSROOMS IN ILLINOIS

(Tests of significance of differences are based on Analysis of Variance and t-tests. All but one of the significant differences exceed the .01 level of confidence. See Appendix C for F tests.)

Dimensions of the Class Activities Questionnaire	Comparison Sample of Average Classrooms N = 69	Reimbursement Sample of Gifted Classrooms N = 28	Demonstration Sample of Gifted Classrooms N = 34
LOWER LEVEL THINKING ABILITIES	2.238* Some emphasis	2.170 Some emphasis	2.169 Some emphasis
HIGHER LEVEL THINKING ABILITIES	2.352 No emphasis	2.069 Some emphasis (Significantly greater than Comparison Group)	2.025 Some emphasis** Significantly greater than Comparison Group)
POSITIVE CLASSROOM FOCUS	2.612 No emphasis	2.304 No emphasis (Significantly greater than Comparison Group)	2.127 Some emphasis (Significantly greater than both the Comparison and the Reimbursement Groups)
POSITIVE CLASSROOM CLIMATE	2.319 No emphasis	1.941 Much emphasis (Significantly greater than the Comparison Group)	1.919 Much emphasis (Significantly greater than the Comparison Group)

*The value shown in each cell is the mean score for the group. A mean under 2.25 indicates some emphasis and under 2.00 much emphasis on the dimension concerned.

**Both Reimbursement and Demonstration classes show almost equal emphasis on both higher and lower level thinking abilities, while Comparison classes show less emphasis on lower thinking abilities and no emphasis on higher levels.

It is clear from the foregoing chart that average classes as a group place little emphasis on any of the four dimensions of instructional climate measured by the CAQ. In contrast both groups of gifted classes differ strikingly from the Average classes sampled here. Gifted classes emphasize most or all of the four dimensions measured.

Within the gifted group demonstration classes are superior to reimbursement classes in only one dimension -- classroom focus. This dimension has been most emphasized in the selection and training of demonstration personnel. That is, classroom focus has been away from the teacher lecturing and being the central figure with little student discussion and much test/grade stress. Also worth mention is the fact that of the four dimensions classroom focus is the easiest to make visible to classroom visitors.

An analysis of variance was also run on the statistical factors with the same results. The three groups are significantly different at the .01 level on Factor I (Application, Synthesis, Enthusiasm, and Independence) and Factor II (Memory and Test/Grade Stress). The gifted classes are superior to the average classes on both factors but there is no difference between the demonstration and reimbursement classes.

Are there patterns of emphasis within these four dimensions which characterize each sample of classes? The ensuing sections will look specifically at the sixteen factors within the four dimensions of the CAQ.

Patterns of Cognitive Emphasis

The first two dimensions of the CAQ, Lower and Higher Thought Processes, are composed of seven hierarchical levels of thinking based on Bloom's Taxonomy. Each higher numbered level includes the lower levels as part of the thinking operation. Thus all of the Higher Thought Processes (Application, Analysis, Synthesis, and Evaluation) utilize the Lower Thought Processes (Memory,

Translation, Interpretation) in performing the thinking operation. The highest level, Evaluation, theoretically could call into play all of the other six levels as subordinate processes in the act of evaluating. By way of illustration, if a student is expected to know a classification system for rock and mineral identification, memorizing is the end implied by the activity. However, if a student is given a bag full of rocks and minerals and is expected to identify them using the classification system, application is the end sought. Here memory or recall of the classification system serves as a means for efficiently identifying the rocks, but not as an end in itself.

What activities predominate in classrooms? In what percent of average classes or gifted classes are activities emphasized which call for each of the thinking processes? The CAQ provides only an indication -- a rough estimate -- of the focus of emphasis, but it is informative.[13]

Table 5 shows the patterns of emphasis which characterize each of the three groups of classes. Only those factors which were seen as emphasized (to any degree) by at least 25% of the classes in a group are considered to characterize a group. (Emphasis by fewer than 25% of the classes is not shown. See Appendix D for complete tables of emphasis for tables 5 and 8.)

Average classes as a group emphasize three of the seven thought processes. The most common focus of emphasis is on Analysis -- breaking things apart into their structural components. (Remember that a particular class might have emphasized one of these levels, or two or three, or none. It might -- unlike the group as a whole -- have emphasized one or more of the other four levels, too.) It should be obvious from this profile that many average classes place

[13]Bear in mind that the lowest level, Memory, as noted previously, is not adequately assessed by the CAQ. Activities requiring rote memory rather than those calling for recall or recognition seems to be assessed. Drill and repetitive exercises are activities not fully reflected in the factor as presently structured.

TABLE 5

CHARACTERISTIC PATTERNS OF COGNITIVE EMPHASIS IN AVERAGE AND GIFTED CLASSES

	Cognitive Levels	% of Classes in Each Group Emphasizing Each Level: Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=74)
LOWER THOUGHT PROCESSES	1. Memory	--	--	--
	2. Translation	39%	57%	47%
	3. Interpretation	30%	64%	82%
HIGHER THOUGHT PROCESSES	4. Application	--	43%	59%
	5. Analysis	58%	90%	74%
	6. Synthesis	--	43%	39%
	7. Evaluation	--	25%	35%

little or no emphasis on any cognitive level. This finding is not totally unexpected. Many studies in the literature of research have reported the unstimulating intellectual environment of the school, the undue amount of emphasis shown in stated objectives and test questions on sheer recall and recognition tasks, and the lack of opportunity for or tolerance of reflective thinking.

Both Reimbursement and Demonstration Gifted Classes are seen as emphasizing six of the seven cognitive levels -- twice as many as the Average classes. A greater proportion of classes emphasize each level in the Gifted group. In fact, a majority of the gifted classes emphasize three of the seven levels. The pattern of emphasis differs slightly between the Reimbursement and Demonstration groups. There is a shift upward in Demonstration classes toward greater emphasis on higher thought processes. A majority of Reimbursement classes emphasize levels 2, 3, and 5 (Translation, Interpretation and Analysis). A majority of

the Demonstration classes emphasize levels 3, 4, and 5 (Interpretation, Application, and Analysis).

Varieties of Cognitive Emphasis

The characteristic patterns of emphasis in Average and Gifted classes indicate that as a group a greater proportion of Gifted classes emphasize a wider variety of cognitive levels than the Average group of classes. But what variety of emphasis occurs in individual classes? Are several levels of thinking emphasized in the same classroom? It would seem appropriate for gifted classes to emphasize a greater variety of thought processes than average classes, as well as emphasizing several of the higher levels of thinking. Table 6 shows the number (not the level) of thought processes emphasized in classrooms in each group.

TABLE 6

TOTAL NUMBER OF THOUGHT PROCESSES EMPHASIZED IN AVERAGE AND GIFTED CLASSROOMS

Number of Thought Processes Emphasized By Individual Classes	% of Classes Emphasizing Each Number of Thought Processes		
	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
None Emphasized	13%	--	--
1*	35%	11%	9%
2	25%	21%	21%
3	19%	25%	23%
4	7%	21%	26%
5	1%	18%	12%
6	--	4%	9%
7	--	--	--

*These numbers do not correspond to the levels of thinking, but only reflect how many thought processes are emphasized by individual classes.

The table shows that while only 8% of the Average classes emphasize four or more thought processes, 43% of the Gifted Reimbursement classes and 47% of the Gifted Demonstration classes emphasize four to six processes. The converse is also true: 48% of the Average classes emphasize one or no thought processes while only 9% and 11% of the two Gifted groups of classes emphasize as few as one or no levels of thinking.

Table 7 shows the number of Higher Thought Processes emphasized in Average and Gifted Classes.

TABLE 7

NUMBER OF HIGHER THOUGHT PROCESSES EMPHASIZED IN AVERAGE AND GIFTED SAMPLES

Number of Higher Thought Processes Emphasized By Individual Classes	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
None Emphasized	28%	4%	6%
1	54%	29%	26%
2	16%	39%	32%
3	1%	21%	21%
4	1%	7%	15%

It can be seen that while only 18% of the Average classes emphasized more than one Higher Thought Process, 67-68% of the two Gifted groups emphasized more than one.

Thus it is clear that individual Gifted classes emphasize many levels of thinking including several higher thought processes. While this variety of emphasis would seem a beneficial instructional climate in any classroom, it seems especially appropriate for the gifted.

Patterns of Emphasis on Noncognitive Classroom Conditions

The third and fourth dimensions of the CAQ are Classroom Focus and Classroom Climate. Classroom Focus is concerned with the center of attention and activity -- on the teacher or the students. Classroom Climate is concerned with the openness of the classroom -- the existence of opportunities and conditions which are motivating and conducive to learning. The relationships of these two dimensions should be obvious.

Table 8 shows the pattern of emphasis which characterize each of the three groups of classes. Again, only those factors which were seen as emphasized by at least 25% of the classes in a group are shown.

TABLE 8

CHARACTERISTIC PATTERNS OF EMPHASIS ON CLASSROOM FOCUS AND CLIMATE IN AVERAGE AND GIFTED CLASSES

	Classroom Conditions	% of Classes in Each Group Emphasizing Each Factor		
		Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
CLASSROOM FOCUS	8. Discussion	30%	89%	88%
	9. Test/Grade Stress	25%	--	--
	10. Lecture	28%	32%	--
CLASSROOM CLIMATE	11. Enthusiasm	--	65%	70%
	(Lack of)	(51%)	(--)	(--)
	12. Independence	28%	71%	79%
	13. Divergence	69%	96%	97%
	(Much Emphasis)	(--)	(71%)	(82%)
	14. Presence of Humor	78%	93%	85%

In the Average Sample about as many classes (one-fourth of the group) seem to emphasize Lecture as emphasize Discussion. As the next table which deals with amount of teacher talk will show, however, the opportunity for discussion is limited due to the amount of teacher talk which occurs. The classroom focus in Average classes seems clearly on the teacher as information-giver, with a limited amount of active involvement of students. As a group Average classes are also characterized by stress on tests and grades.

In the Classroom Climate dimension, the most striking characteristic of Average classes is the lack of enthusiasm. In less than 25% of the classes are students excited and involved. On the contrary, in over half the Average classes students are not just neutral but negative and uninterested in class activities. As a group Average classes permit some opportunity for independence and divergence, however a very high degree of opportunity for divergent activities is not characteristic of Average classes. The presence of humor and laughter is characteristic of all three groups of classes studied.

In contrast to the Average group, almost all classes in the two Gifted groups emphasize discussion. Gifted students have opportunity and are involved in discussion. An emphasis on tests and grades is not characteristic of gifted classes. For the Reimbursement Gifted classes, lecture is still a characteristic of Classroom Focus in addition to the strong emphasis on discussion.

Both groups of Gifted classes are characterized by an extremely positive Classroom Climate. In a majority of the gifted classes students are excited and involved in class activities. There is opportunity for independent activities and much opportunity for divergent activities. As was true in the Cognitive dimensions a greater proportion of the classes in the Gifted groups emphasized positive classroom focus and classroom climate than Average classes.

Teacher Talk

The percentage of class time consumed by the teacher speaking is in itself a revealing index of positive classroom conditions. The more teacher talk, the more passive a role of the student has in class activities. Teacher talk occurring 75% or more of the time generally signals an authoritarian teacher and extremely bored students. Conversely, teacher talk occurring 40% or less of the time usually entails an open climate with much student participation and involvement. While it is not impossible for an active learning atmosphere to exist with incessant teacher talk, the burden to maintain interest and stimulate reflective thinking amidst a flood of words is heavier than most teachers can bear. On the other hand, a class in which there is little teacher talk thrusts the student into an active role; the potential is there for the student to assume the initiative with all of the positive benefits which that produces.

Table 9 shows the percent of teacher talk in Average and Gifted classes. As was pointed out in an earlier section, students are extremely accurate in making this estimate.

In all groups the median amount of teacher talk is 60% of the class time. However, the teacher talks less than half the time in 1/9 (12%) of the Average classes, 1/5 (21%) of the Gifted Reimbursement classes, and 1/3 (35%) of the Gifted Demonstration classes. Note the extremes:

	% of Teachers in Each Group		
	Average	Reimbursement	Demonstration
High (75-90% teacher talk)	55%	43%	6%
Low (10-25% teacher talk)	3%	14%	21%

TABLE 9

PERCENT OF TEACHER TALK IN AVERAGE AND GIFTED CLASSES

(Based on the median student estimate of teacher talk per class.)

% of Teacher Talk During Classtime		Percentage of Classes per Group		
		Average Group	Reimbursement Group	Demonstration Group
High Amount of Teacher Talk	90%	19	11	--
	75%	36	32	06
	60%	33	36	59
	40%	09	07	14
Low Amount of Teacher Talk	25%	03	11	21
	10%	--	03	--
		100% (N=69)	100% (N=28)	100% (N=34)

There is a dramatic decrease in teacher talk from Average to Gifted Demonstration classes. The percentage of classes in which an extremely low amount of teacher talk prevails increases sharply from Average to Demonstration Classes. It is disheartening to discover that in over half of the average classes the teacher talks from 75-90% of the time. In this age of multi-media information processing, the teacher still appears to define his role as information-giving.

Preparation for Class

Students estimated the amount of time each week they spent preparing for class. Bear in mind that their estimate concerns only one of five to seven or more subjects for which homework could be expected. The estimate includes a variety of outside-of-class activities, not simply the amount of homework assigned. Some of the preparation might be voluntary instead of

required work. Table 10 shows the amount of time spent preparing for class weekly for Average and Gifted Classes.

TABLE 10

TIME SPENT PREPARING FOR CLASS EACH WEEK IN AVERAGE AND GIFTED CLASSES

(Based on the median student estimate for each class.)

Hours of Preparation Time Each Week	Sample of Average Classes (N=69)	Sample of Gifted Reimbursement Classes (N=28)	Sample of Gifted Demonstration Classes (N=34)
Less than 1 hour	10%	0%	35%
From 1 to 2 hours	67%	43%	44%
More than 2 hours	23%	57%	21%

It can be noted in the Table that students in a large proportion of classes in all three groups spend from 1 to 2 hours per week on homework of some kind. This is somewhat less than one-half hour each evening. The two Gifted groups show some variation from this pattern, but in opposite directions. The majority of students in Gifted Reimbursement classes spend more than 2 hours a week preparing for class. Gifted Demonstration students in over one-third of the classes spend less than one hour per week on outside preparation.

It is difficult to account for this difference without information on the nature of outside-of-class activities. One hypothesis might be that in program development for the gifted a provision often introduced is to increase the amount of work covered and the difficulty of the problems, rather than deal with problems of greater complexity which require a broader range of processes and solutions. Another hypothesis might be that the newly developed gifted programs represent refreshing innovations for the particular school involved which in turn produce increased motivation and involvement among students

leading to more time spent on projects and assignments. In contrast, Demonstration gifted programs strongly de-emphasize grades and the student may feel he can safely reallocate his time to classes where he must compete for high grades. Also, the emphasis in Demonstration gifted programs seems to be as much on process as on product. That is, teachers are often less insistent that a quantity of tangible "products" are produced by students. Some demonstration teachers do not push as hard to "cover the material," as the focus is not on students ingesting as many facts as possible. These conditions would tend to result in a smaller amount of preparation time required of students outside class.

Summary

Based on the Class Activities Questionnaire, significant differences are found between Average and Gifted Illinois classes in the degree of emphasis on higher thought processes, classroom focus, and classroom climate. Significant differences are also noted between Average and Gifted classes on the statistical factors of "Application, Synthesis, Enthusiasm, and Independence" and "Memory and Test/Grade Stress."

Specifically the following differences are noted:

Average Classes	Gifted Classes
1. Most classes emphasize few (2 or less) thought processes.	1. Most classes emphasize many (3 or more) thought processes.
2. Most classes emphasize only one (if any) of the higher thought processes.	2. Most classes emphasize two or more of the higher thought processes
3. As a group, Average classes emphasize 3 of the 7 levels of thinking: Translation, Interpretation, Analysis.	3. As a group, Gifted classes emphasize 6 of the 7 levels of thinking.
4. A higher amount of teacher talk occurs.	4. A moderate amount of teacher talk occurs.

Average Classes	Gifted Classes
5. Classes have little opportunity for or involvement in discussion.	5. Classes have much opportunity for and involvement in discussion.
6. Test/grade stress is characteristic of Average classes as a group.	6. Test/grade stress is not characteristic of Gifted classes as a group.
7. There is an absence of enthusiasm in a majority of the classes.	7. The presence of enthusiasm characterizes almost all classes.
8. There is little opportunity for independence.	8. There is much opportunity for independence.
9. The focus is on the teacher as information-giver with a passive role for students.	9. The focus is on the student taking an active role in the class.

CONCLUSIONS

The goals of the Illinois Plan for local programs have been expressed as follows:

> Programs should be designated not only for learning but they should also be designed for thinking. Simple recall and memory work should be strongly supplemented by other types of mental operations such as those suggested by J. P. Guilford in his paper, The Three Faces of the Inteilect. E. Paul Torrance lists critical, creative, constructive, independent, logical, liberal, and analytical, as types of thinking. A clear recognition on the part of the instructional staff concerning the thought processes involved in the learning situation is necessary if the chances are to be in favor of changes beyond that of materials and administration. Education should place emphasis on learning how to think instead of what to think, with evaluation methods reflecting the same philosophy.
>
> Development of other characteristics, unrelated to academic achievement, which might be supported include:
>
> | | |
> |---|---|
> | Leadership potential | Unusual vocabulary development |
> | Sensitivity to needs of others | Abstract thinking |
> | Divergent thinking ability | Insight into problems |
> | Interest in creative activities | Reasoning |
> | High goal orientation | Problem solving |
> | Kinesthetic abilities | Humor and wit |
> | Foresight | Range of interest and curiosity[14] |

It is clear that where developed gifted programs exist, many state goals have been realized. Higher thinking processes are emphasized; students are enthusiastic; there is opportunity for independence and a tolerance for divergence. Especially when compared to heterogeneously grouped classes or classes of average students, the gifted classes are far superior. They have clearer cognitive focus, more student discussion, less teacher domination and less test and grade stress. In general, the gifted classes appear more productive, stimulating, and healthier.

---

[14]Colton, David L. Policies of the Illinois Plan for Program Development for Gifted Children. Washington University, St. Louis, 1968.

When an ideal standard is applied, one weakness of the gifted classes is that only 31% emphasize "evaluation" and only 40% emphasize "synthesis," the two highest thought processes. But the main weakness is that so many students are not in highly developed programs. Why this is so is the subject of another paper.[15]

Finally, the Factor analysis suggests that the thought processes, classroom climate, and classroom focus are not independent of one another. Factor 1 indicates that Application, Synthesis, Enthusiasm, and Independence occur together. Factor 2 shows that emphasis on Memory is connected with test and grade stress. One might assume that certain classroom activities produce the Factor 1 pattern while a very different set underlies Factor 2. There factors may reflect two distinctly different types of classroom -- one active, one passive; one good, one bad.

This study only documents the existence of such patterns. Where are such instructional styles likely to lead the student? A partial answer is given by Chickering[16] in his review of the effects of different curricula, teaching methods, and evaluation procedures at the college level. The passive, teacher-centered style results in better learning of specific facts. On the other hand,

> In 11 studies, significant differences in ability to apply concepts, in attitudes, in motivation, or in group membership skills have been found between discussion techniques emphasizing freer student participation compared with discussion with greater instructor dominance. In 10 of these the differences favored the more student-centered method . . . .
>
> In short, the choice of instructor-dominated versus student-centered discussion techniques appears to depend upon one's goals. The more highly one values outcomes going beyond acquisition of knowledge, the more likely that student-centered methods will be preferred (p. 1140).

---

[15]See House, Steele, Lapan, Kerins. The Development of Special Programs, to be published in Sept. 1970.

[16]Chickering, Arthur W. Education and Identity. Jossey-Bass Inc. San Francisco, 1969.

In non-cognitive areas Chickering reports that development of competence, autonomy, and identity and the freeing of interpersonal relationships are fostered when the orientation of the teacher is such that he is not the final authority and as classes are group discussions with ample exchange among students as well as between students and teacher. Development of autonomy and identity and the freeing of interpersonal relationships are fostered as pressures for achievement are reduced.

It would appear that the goals of the Illinois Plan are being successfully pursued in both intent and consequences in many classrooms.

APPENDICES

APPENDIX A

TAXONOMY OF INTELLECTUAL ABILITIES

TAXONOMY OF INTELLECTUAL ABILITIES
(Adapted from Bloom's Taxonomy by Joe M. Steele)

I. MEMORY

Recall, recognition, bringing to mind of any kind of information. Some alteration of the material may be required, but this is a minor part of the task. Memory involves the ability to reproduce or recognize information as it was presented.

II. TRANSLATION

Changing information into a different symbolic form to express the same idea, such as the use of paraphrasing, pictures, graphs, summaries, outlines, or statements in technical or layman's language. It also includes the use of metaphor, symbolism, and other non-literal statements. Translation involves the ability to comprehend information, including recasting or altering it in various ways.

III. INTERPRETATION

Discovering and exploring the interrelationships among ideas (on a common-sense level). Comparing, contrasting, and explaining information based on the new view the perceived relationships provide. The task may require going beyond the given data in making inferences, predicting trends, and determining implications and consequences. Interpretation involves the ability to extend and manipulate information to clarify relationships suggested by the data or to project trends based on patterns apparent in the data.

IV. APPLICATION

Utilizing abstractions (generalizations, rules, skills) in concrete situations. Selecting and applying rules or methods to solve a specific problem, usually with a minimum of direction or prompting as to which abstractions apply or how to use them. This kind of task gives practice in the independent use of knowledge and skills, requiring the identification of the issue as well as selection and use of the correct abstractions to solve problems in practical settings. Application involves the ability to select the methods or generalizations called for by specific problem situations and perform the operations required to solve the problem.

V. ANALYSIS

Conducting a methodical inquiry into the structure of material and the nature of its interrelationships, applying the appropriate rules of reasoning. Analysis includes the ability to recognize unstated assumptions, distinguish facts from hypotheses and normative statements, and check for logical consistency. Analysis involves the ability to break down material into its structural components to test the validity of statements, arguments, and conclusions.

VI. SYNTHESIS

Recombining parts of previous experience with new material into a new integrated whole, pattern, or structure not clearly there before. Synthesis implies a new product requiring original, creative thinking. This can take the form of a unique communication involving skill in writing or speaking; a proposed set of operations, such as ways of testing hypotheses or developing an effective plan to solve a complex problem; or the derivation of abstract relations, as in making generalizations or mathematical discoveries. Synthesis involves the ability to generate new ideas and solutions: inventing, designing, composing, creating.

VII. EVALUATION

Clarifying and using a standard of appraisal in making judgments about the value of materials or methods for given purposes. In making judgments of good or bad, right or wrong, the standards or criteria used should be made explicit. This category forms a major link with the affective domain where values, liking, and enjoying are central processes. Evaluation is always somewhat subjective because either the standard cannot be proven to be correct or the idea to be judged cannot be proven to violate or illustrate the standard. Evaluation involves the ability to develop and apply a set of standards for judging worth, and to support the judgments with a justification or rationale based on the criteria used.

APPENDIX B

CLASS ACTIVITIES QUESTIONNAIRE

CLASS ACTIVITIES QUESTIONNAIRE

For each sentence below, circle the letters which show the extent to which you AGREE or DISAGREE.

Base your answer on how well each sentence describes what is stressed in your class--what your teacher has you do.

Circle	SA	If you STRONGLY AGREE with the sentence
Circle	A	If you AGREE moderately with the sentence
Circle	D	If you DISAGREE moderately with the sentence
Circle	SD	If you STRONGLY DISAGREE with the sentence

1.	Remembering or recognizing information is the student's main job.	SA	A	D	SD
2.	A central activity is to make judgments of good/bad, right/wrong, and explain why.	SA	A	D	SD
3.	Students actively put methods and ideas to use in new situations.	SA	A	D	SD
4.	Most class time is spent doing other things than listening.	SA	A	D	SD
5.	The class actively participates in discussions.	SA	A	D	SD
6.	Students are expected to go beyond the information given to see what is implied.	SA	A	D	SD
7.	Great importance is placed on logical reasoning and analysis.	SA	A	D	SD
8.	The student's job is to know the one best answer to each problem.	SA	A	D	SD
9.	Restating ideas in your own words is a central concern.	SA	A	D	SD
10.	Great emphasis is placed on memorizing.	SA	A	D	SD
11.	Students are urged to build onto what they have learned to produce something brand-new.	SA	A	D	SD
12.	Using logic and reasoning processes to think through complicated problems (and prove the answer) is a major activity.	SA	A	D	SD
13.	A central concern is practicing methods in life-like situations to develop skill in solving problems.	SA	A	D	SD
14.	Students are encouraged to independently explore and begin new activities.	SA	A	D	SD
15.	There is little opportunity for student participation in discussions.	SA	A	D	SD

16. Students are expected to read between the lines to find trends and consequences in what is presented. SA A D SD

17. Students are encouraged to discover as many solutions to problems as possible. SA A D SD

1i. Detailed examination of ideas and conclusions is a major activity. SA A D SD

20. The student's major job is to made judgments about the value of issues and ideas. SA A D SD

21. Great importance is placed on explaining and summarizing what is presented. SA A D SD

22. There is a great concern for grades in this class. SA A D SD

23. Inventing, designing, composing, and creating are major activities. SA A D SD

24. Students mainly compare ideas to find likenesses and differences. SA A D SD

25. There is very little joking or laughing in this class. SA A D SD

Did you circle an answer for each question?

26. On the average, the teacher tlaks how much of the time: 90% 75% 60% 40% 25% 10%

27. On the average, how much time do you spend preparing for this class each <u>week</u>? (circle the time spent)

0 ½hr. 1hr. 1½hrs. 2hrs. 2½hrs. 3hrs. 3½hrs. 4hrs. 5hrs. more

28. List the three best things about this class from your own point of view:

1)_____

2)_____

3)_____

29. If you could change three things about the class, what would they be?

1)_____

2)_____

3)_____

COMMENTS: If you have any comments, please write them on the back of this page.

APPENDIX C

ANALYSIS OF VARIANCE AND T-TEST RESULTS FOR CAQ SUBSCORES

TABLE A

ANALYSIS OF VARIANCE RESULTS FOR LOWER THOUGHT PROCESSES SUBSCORES

Source	df	SS	MS	F ratio
Between	2	.14	.07	2.44*
Within	128	3.66	.03	
Total	130	3.80		

*p > .05 (Not Significant)

TABLE B

ANALYSIS OF VARIANCE RESULTS FOR HIGHER THOUGHT PROCESSES SUBSCORES

Source	df	SS	MS	F ratio
Between	2	2.68	1.34	40.29**
Within	128	4.26	.03	
Total	130	6.95		

**p < .001

TABLE C

ANALYSIS OF VARIANCE RESULTS FOR CLASSROOM FOCUS SUBSCORES

Source	df	SS	MS	F ratio
Between	2	6.03	3.02	37.52**
Within	128	10.29	.08	
Total	130	16.32		

**p < .001

TABLE D

ANALYSIS OF VARIANCE RESULTS FOR CLASSROOM CLIMATE SUBSCORES

Source	df	SS	MS	F ratio
Between	2	4.40	2.20	31.64**
Within	128	8.90	.07	
Total	130	13.30		

**p < .001

TABLE E

VALUES OF STUDENT'S t COMPARING DIFFERENCES BETWEEN MEANS FOR THE AVERAGE AND GIFTED SAMPLES ON EACH OF THE GOUR CAQ SUBSCORES

Comparisons	df	Mean	SD	Difference Between Means	t
SUBSCORE 1: LOWER THOUGHT PROCESSES					
Average & Reimbursement	95	2.223	.177	.053	1.384
Average & Demonstration	101	2 214	.157	073	2.019*
Reimbursement & Demonstration	60	2.174	.163	.020	.482
SUBSCORE 2: HIGHER THOUGHT PROCESSES					
Average & Reimbursement	95	2.276	188	.264	6.643***
Average & Demonstration	101	2.252	.145	.303	7.570***
Reimbursement & Demonstration	60	2.067	.197	.040	885
SUBSCORE 3: CLASSROOM FOCUS					
Average & Reimbursement	95	2.524	.265	.304	4.593***
Average & Demonstration	101	2.449	.365	.495	9.186***
Reimbursement & Demonstration	60	2.203	.242	.190	2.454**
SUBSCORE 4: CLASSROOM CLIMATE					
Average & Reimbursement	95	2.212	.273	.370	6 054***
Average & Demonstration	101	2.198	.273	.365	6.662***
Reimbursement & Demonstration	60	1 952	.236	.006	085

*$p < .05$, however ANOVA for Subscore 1 was not significant.

**$p < .02$

***$p < .001$

APPENDIX D

PATTERNS OF COGNITIVE AND NONCOGNITIVE EMPHASIS IN GIFTED AND AVERAGE SAMPLES

COGNITIVE CAQ FACTORS CLEARLY OR STRONGLY EMPHASIZED (OR DE-EMPHASIZED) BY CLASSES

(Percentage of classes per sample shown.)

Instructional Climate Factors		Average Sample %	Reimbursement %	Demonstration %
1. Memory				
	Absence of	0%	0%	0%
	Some	7%	4%	0%
	Much	6%	0%	0%
2. Translation				
	Absence of	0%	0%	0%
	Some	32%	36%	26%
	Much	7%	21%	21%
3. Interpretation				
	Absence of	3%	0%	0%
	Some	23%	18%	47%
	Much	7%	46%	35%
4. Application				
	Absence of	1%	0%	0%
	Some	15%	36%	38%
	Much	0%	7%	21%
5. Analysis				
	Absence of	0%	0%	0%
	Some	38%	29%	27%
	Much	20%	61%	47%
6. Synthesis				
	Absence of	3%	0%	0%
	Some	6%	14%	18%
	Much	4%	29%	21%
7. Evaluation				
	Absence of	0%	0%	0%
	Some	12%	21%	32%
	Much	0%	4%	3%
		N = 69	N = 28	N = 34

NONCOGNITIVE CAQ FACTORS CLEARLY OR STRONGLY EMPHASIZED (OR DE-EMPHASIZED) BY CLASSES

(Percentage of classes per sample shown)

Classroom Conditions Factors		Average Sample %	Reimbursement %	Demonstration %
8. Discussion				
	Absence of	2%	0%	0%
	Some	13%	14%	6%
	Much	17%	75%	82%
9. Test/Grade Stress				
	Absence of	2%	18%	6%
	Some	12%	18%	0%
	Much	13%	4%	0%
10. Lecture				
	Absence of	0%	4%	15%
	Some	12%	21%	0%
	Much	16%	11%	3%
11. Enthusiasm				
	Absence of	51%	11%	12%
	Some	12%	29%	29%
	Much	2%	36%	41%
12. Independence				
	Absence of	14%	7%	12%
	Some	19%	32%	32%
	Much	9%	39%	47%
13. Divergence				
	Absence of	0%	0%	0%
	Some	46%	25%	15%
	Much	23%	71%	82%
14. Presence of Humor				
	Absence of	4%	4%	6%
	Some	16%	14%	29%
	Much	62%	79%	56%
15. Teacher Talk				
	High (75-90%)	55%	43%	6%
	Low (10-25%)	3%	14%	21%
	60%	33%	36%	59%
	40%	9%	7%	14%
16. Homework				
	Less than 1 hr.	10%	0%	35%
	1 - 2 hrs.	67%	43%	44%
	More than 2 hrs.	23%	57%	21%
		N = 69	N = 28	N = 34