NRC G/T

THE NATIONAL RESEARCH CENTER ON THE GIFTED AND TALENTED

University of Connecticut
University of Virginia
Yale University

The Feasibility of High-end Learning in a Diverse Middle School

Catherine M. Brighton
Holly L. Hertberg
Tonya R. Moon
Carol A. Tomlinson
Carolyn M. Callahan
University of Virginia
Charlottesville, Virginia

September 2005
RM05210

The Feasibility of High-end Learning in a Diverse Middle School

Catherine M. Brighton
Holly L. Hertberg
Tonya R. Moon
Carol A. Tomlinson
Carolyn M. Callahan
University of Virginia
Charlottesville, Virginia

September 2005
RM05210

THE NATIONAL RESEARCH CENTER ON THE GIFTED AND TALENTED

The National Research Center on the Gifted and Talented (NRC/GT) is funded under the Jacob K. Javits Gifted and Talented Students Education Act, Institute of Education Sciences, United States Department of Education.

The Directorate of the NRC/GT serves as an administrative and a research unit and is located at the University of Connecticut.

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

University of Connecticut
Dr. Joseph S. Renzulli, Director
Dr. E. Jean Gubbins, Associate Director
Dr. Sally M. Reis, Associate Director

University of Virginia
Dr. Carolyn M. Callahan, Associate Director

Yale University
Dr. Robert J. Sternberg, Associate Director

Copies of this report are available from:
NRC/GT
University of Connecticut
2131 Hillside Road Unit 3007
Storrs, CT 06269-3007

Visit us on the web at:
http://www.gifted.uconn.edu

The work reported herein was supported under the Educational Research and Development Centers Program, PR/Award Number R206R000001, as administered by the Institute of Education Sciences, U.S. Department of Education. The findings and opinions expressed in this report do not reflect the position or policies of the Institute of Education Sciences or the U.S. Department of Education.

Note to Readers...

All papers by The National Research Center on the Gifted and Talented may be reproduced in their entirety or in sections. All reproductions, whether in part or whole, should include the following statement:

The work reported herein was supported under the Educational Research and Development Centers Program, PR/Award Number R206R000001, as administered by the Institute of Education Sciences, U.S. Department of Education. The findings and opinions expressed in this report do not reflect the position or policies of the Institute of Education Sciences or the U.S. Department of Education.

This document has been reproduced with the permission of The National Research Center on the Gifted and Talented.

If sections of the papers are printed in other publications, please forward a copy to:

The National Research Center on the Gifted and Talented
University of Connecticut
2131 Hillside Road Unit 3007
Storrs, CT 06269-3007

Please Note: Papers may not be reproduced by means of electronic media.

The Feasibility of High-end Learning in a Diverse Middle School

Catherine M. Brighton
Holly L. Hertberg
Tonya R. Moon
Carol A. Tomlinson
Carolyn M. Callahan
University of Virginia
Charlottesville, Virginia

ABSTRACT

This study was an investigation of staff development programs designed to provide teachers with strategies through which all learners, including gifted, minority, and limited-English proficient students, can be appropriately served in a middle school environment sensitive to diverse learner academic needs. Participants in the study were assigned to either one of two experimental groups (Differentiated Instruction or Differentiated Authentic Assessment) or to a comparison group. Using a concurrent mixed method design, data were collected and analyzed relating to (a) the effects on teachers and students of a staff development program focusing on differentiated instruction, and (b) the effect on teachers and students of a staff development program focusing on differentiated authentic assessment strategies. Results suggest that differentiation of instruction and assessment are complex endeavors requiring extended time and concentrated effort to master. Add to these complexity current realities of school such as large class sizes, limited resource materials, lack of planning time, lack of structures in place to allow collaboration with colleagues, and ever-increasing numbers of teacher responsibilities, and the tasks become even more daunting.

The Feasibility of High-end Learning in a Diverse Middle School

Catherine M. Brighton
Holly L. Hertberg
Tonya R. Moon
Carol A. Tomlinson
Carolyn M. Callahan
University of Virginia
Charlottesville, Virginia

EXECUTIVE SUMMARY

This project was an investigation of staff development programs designed to provide teachers with strategies through which all learners, including gifted, minority, and limited-English proficient students, can be appropriately served in a middle school environment sensitive to diverse learner academic needs. Participants in the study were assigned to either one of two experimental groups (Differentiated Instruction or Differentiated Authentic Assessment) or to a comparison group. Using a concurrent mixed method design, data were collected and analyzed relating to (a) the effects on teachers and students of a staff development program focusing on differentiated instruction, and (b) the effect on teachers and students of a staff development program focusing on differentiated authentic assessment strategies.

Statement of the Problem

Americans continue to be concerned with improving education for adolescents. While discussions of educational reform in general continue in the media and in professional circles, particular issues such as ability grouping, appropriate curricular practices, standards-based assessment, adolescent development, and cultural diversity dominate educational debates about the appropriate schooling for the middle school child. Current educational practices in the middle school as they relate to curriculum, instruction, and assessment have come under scrutiny due to pressures from the standards movement in general and high-stakes testing in particular.

Historically, the emphasis in middle level education has been on creating schools that provide the same educational experience for all. A strong equity approach to schooling leads proponents of middle schools to oppose identification and grouping practices that may have a negative effect on at-risk learners. Middle school practice as abstracted from core writings of the National Middle School Association (NMSA) and research on middle school education often appears at worst hostile and at best indifferent to many concerns of gifted education (Sicola, 1990; Tomlinson, 1992a). In part, the negative atmosphere results from reluctance on the part of many leaders in the middle school movement for "identifying" learners in ways that set them apart from peers.

Identification and instruction of learners identified as gifted is also shunned by many middle school advocates, in part because of the implication that identification of some learners as highly able excludes others from rich learning opportunities often made available only to gifted learners, and in part because ability grouping is seen as disadvantageous for at-risk learners (George & Grebin, 1995). Programs for the gifted, when based on grouping according to ability, have been viewed by some as excluding learners from programs that could have provided benefit to a wider range of students (Sapon-Shevin, 1994). Programs for the gifted have also been criticized for inadequacies in identifying and developing talent in high-ability/at-risk middle schoolers (Sapon-Shevin, 1995). Currently, standards and assessments that imply the same learning is appropriate for all students reinforce common learning experiences. Consequently, little research has been conducted on meeting the unique needs of academically diverse learners despite nearly 20 years of criticism of middle school practices that seem to deny individual differences in practice, if not in theory.

Also contributing to a general lack of focus on the needs of advanced learners among middle school educators is a belief stated in earlier middle school literature that middle schoolers are in a plateau period of brain growth that inhibits acquisition of new concepts and skills as well as abstract reasoning (Ford, 1994; Frasier et al., 1995). This belief, while later retracted in some middle school literature, persists, both in print (*This We Believe: Developmentally Responsive Middle Level Schools*, 1995) and in the belief system of a large number of middle school practitioners (Moon, Tomlinson, & Callahan, 1995). This belief may have contributed to the tardiness of the middle school movement in defining what constitutes an appropriate curriculum for any early adolescent learner (Tomlinson, 1992a). Whatever the reasons, the middle school movement has only recently begun a concerted effort to describe criteria for curriculum and instruction in the middle grades (Beane, 1990). In regard to what would characterize "advanced" learning during early adolescence, the literature of middle school is virtually mute. Consequently, many educators of the gifted have expressed concern about the affective development of high-ability early adolescents if they traverse the middle school years without educator awareness and/or acceptance of their need to achieve at high levels in order to grow in self-efficacy (Robinson, 1990; Rogers, 1991, 1993; Tomlinson, 1992a, 1992b).

Perhaps because of its reluctance to elaborate on student differences, the middle school movement has also been reticent in addressing learning differences that may result from varied cultural profiles—a somewhat ironic fact given the movement's strong equity stance (Moon et al., 1995). It is not surprising, then, that information relating to high-potential minority or limited-English proficient students or students from impoverished environments are scant in the writings of the NMSA.

Over the last two decades, educational reform efforts (e.g., state accountability mandates, national goals movement) have emphasized student performance and standards. While government agencies have placed great emphasis on high-stakes testing, within the education community attention to and advocacy for authentic assessments has increased substantially. Proponents of authentic assessment argue that performance assessments provide a much clearer and more critically important picture of

student learning and progress than standardized, traditional instruments because they focus on such aspects of achievement as problem-solving, problem-finding, critical thinking, and decision-making (Wiggins & McTighe, 1998).

Although measurement is an integral part of every classroom environment, and considered an integral part of the instructional process, the narrow scope of the measurement research has resulted in little knowledge about the nature, role, and quality of assessments developed and used by teachers in the classroom (Stiggins, Griswold, & Wikelund, 1989). Lazar-Morris, Polin, May, and Barry (1980), in a comprehensive review of testing in schools, concluded:

> In-class assessments made by individual teachers have yet to be examined in depth. How these and other assessments are united with teacher instructional decision-making processes and how they affect classroom organization and time allocation to other objectives are areas that should be explored. (pp. 24-25)

Stiggins (1999a) echoes this sentiment in more recent literature:

> These are the assessments that inform the day-to-day decisions that lead to learning and that motivate learners to believe in or lose faith in and reject their own academic potential. Yet these are the assessments that we have all but ignored in our journey to school improvement. (p. 193)

Recognizing that one-third to three-quarters of assessments used in classrooms are teacher-developed (Herman & Dorr-Bremme, 1982), and that very little teacher training focuses on classroom assessment (Coffman, 1983; Stiggins, 1999b; Stiggins & Bridgeford, 1982), attention must be directed toward documenting and improving quality classroom assessments, some of which are differentiated authentic assessments. Omission of teacher-developed tests from prominent measurement research disregards the full range of measurement options available to teachers, and more importantly, it fails to help teachers produce data needed to address day-to-day instructional decisions (Stiggins & Bridgeford, 1982).

The effect of assessment on curriculum has been postulated as pervasive (Popham, 1994). In the process of examining ways to influence curriculum and instruction in middle school classrooms, it is critical to examine ways assessment strategies used by teachers interact with and influence changes made by teachers in instruction, and vice versa.

Purpose of the Study

The purpose of this research was twofold: (a) to examine the effect on teachers and students of a staff development program focusing on differentiated instruction in the heterogeneous classroom, and (b) to examine the effect on teachers and students of a staff development program focusing on differentiated authentic assessment strategies. To

understand how middle school administrators, teachers, and students respond when differentiated instruction or differentiated authentic assessment is presented as playing a major role in class routines, a 3-year staff development intervention was implemented in 6 middle schools in 3 different states. The study investigated the success of strategies in which the middle school concept and principles of gifted education were joined in a staff development program aimed at helping teachers provide engaging and challenging learning for all early adolescents, including traditionally recognized high-ability learners and at-risk, high-potential learners. Differing treatments were used to probe understanding of relative effects and merits of helping middle school teachers learn to: (a) fully differentiated instruction in middle school classes vs. (b) use a range of differentiated authentic assessment strategies to understand and address varied learner needs. In addition to the qualitative data collected from coaching, interviewing, and observing in these middle schools, quantitative data were gathered in the spring and fall every year of the study. Standardized test scores; product and performance assessment data; scores on self-concept measures for academic and general self-concept; and scores on measures of student attitudes toward learning, teachers, language arts, and mathematics were collected at the points in which students "entered" the experimental treatment and "exited" the treatment. For example, in the first implementation year of the study sixth and seventh grade students were assessed. The seventh graders were assessed in the spring of the next year (the year they left middle school), but the sixth graders were not assessed until the third year of the project (their last year of middle school). Survey data on teachers' instructional practices were collected at the beginning of the project and at the completion of the project.

Research Questions

Quantitative Questions

Quantitative methods were used to examine the effect of interventions on students assigned to teachers who were participating in the project, including achievement, attitudes, self-concept, and specific content areas. Specifically, data collection was designed to address the following research questions:

RQ 1: Are there differences in student achievement, as measured by standardized achievement tests, across the two treatment groups and the comparison group?

RQ 2-3: Are there differences in students' attitudes toward learning, toward teachers, toward language, and toward math, as measured by Arlin-Hills Attitude Surveys across the two treatment conditions and the comparison group?

RQ 4-5: Are there differences in student academic self-concept and general self-concept, as measured by the Self-Description Questionnaire II (SDQII) across the two treatment conditions and the comparison group?

Qualitative Questions

The general question for the qualitative component of the study was*: How do middle school teachers and students respond when differentiated instruction and/or differentiated authentic assessment are assigned a major role through staff development initiatives, and why do they respond as they do?* The following general questions were created prior to the study and guided data collection throughout the study:

RQ 1: How do teachers' feelings about differentiated instruction change as they increase in their understanding of its components and progress through implementation of those components in their classrooms?

RQ2: How do teachers' feelings about differentiated authentic assessment change as they increase in their understanding of its components and progress through implementation of those components in their classrooms?

RQ3: How does learning about and implementing differentiated authentic assessments affect teacher awareness of and interaction with learners?

RQ4: How do teachers incorporate information from pre-assessment of students into their lesson planning and classroom routines?

RQ5: What factors inhibit and foster teachers' implementation of differentiated instruction?

RQ6: What factors inhibit and foster teachers' implementation of differentiated authentic assessment strategies?

RQ7: In what ways do teachers mesh previous images of teaching with new images presented as they learn about and begin to establish differentiated classrooms?

RQ8: How do students (including academically and culturally diverse middle schoolers) come to understand and respond to differentiated environments?

RQ9: How do students come to understand and respond to differentiated authentic assessment strategies?

RQ10: What effect does teachers' sharing of their thinking (metacognition) about differentiation with students have on student understanding and acceptance of differentiated classrooms?

RQ11: How do teachers participating in the two conditions differ in the variety of techniques they consider for assessing children in their classrooms?

Methods and Procedures

Treatment Groups

Treatment #1: Differentiated Instruction

Teachers took part in extensive staff development related to differentiation of curriculum and instruction in heterogeneous middle school core classes (math, science, English, and social studies), with the goal of promoting challenging learning for all students, including escalation toward expert-level learning and production for advanced learners. Teachers were provided instruction on how to pre-assess learners; adapt content, process, product, and learning environments for middle schoolers of various readiness levels, learning profiles, and interests; manage a differentiated classroom; plan for and report student growth; and address the unique learning needs of early adolescents in a differentiated setting.

Treatment #2: Differentiated Authentic Assessment

Teachers focused on roles and applications of assessment in heterogeneous middle school settings. They learned to pre-assess students, develop product rubrics, and develop and use differentiated authentic assessment strategies in response to student profiles and the middle school concept. The basic concepts of differentiated instruction were shared with Treatment #2 teachers, but in a more general way and in a broader framework than with Treatment #1 teachers. That is, principles of differentiated instruction beyond differentiated authentic assessment were not presented.

Treatment #3: Comparison

Three schools served as a comparison group with no treatment (i.e., staff development) for teachers during the period of the study. Opportunities for staff development on differentiated instruction and differentiated authentic assessment were made available to the comparison group staff of each school following the study so that they were not deprived of information that might be useful to them.

In summary, in all nine schools' teacher surveys, student standardized tests and surveys, and observations and interviews were used to monitor teacher change and effects of change on middle school learners, again with emphasis on advanced learners and high-risk, high-potential students.

Findings

The complex nature of this intervention study produced many findings in several areas across teachers and students. Only highlights of the study's findings are shared in this executive summary. For complete details, see the full technical report.

On their own, differentiation of instruction and assessment are complex endeavors requiring extended time and concentrated effort to master. Add to this complexity current realities of school such as large class sizes, limited resource materials, lack of planning time, lack of structures in place to allow collaboration with colleagues, and ever-increasing numbers of teacher responsibilities, and the tasks become even more daunting.

Most challenging, perhaps, to teachers' use of differentiated instruction and assessment in the classroom is the fact that the philosophy of teaching and learning underlying these approaches conflicts with the deep structure beliefs about school commonly held in our society.

The vast majority of participating teachers began the study reporting traditional approaches to teaching and learning such as direct instruction and lecture and the whole class doing the same seatwork, approaches that remained throughout the study for the vast majority of teachers. Many aspects of differentiation of instruction and assessment (e.g., assigning different students different work, promoting greater student independence in the classroom) challenged teachers' beliefs about fairness, about equity, and about how classrooms should be organized to allow students to learn most effectively. As a result, for most teachers, learning to differentiate entailed more than simply learning new practices. It required teachers to confront and dismantle their existing, persistent beliefs about teaching and learning, beliefs that were in large part shared and reinforced by other teachers, principals, parents, the community, and even students. The combination of the inherent complexity of differentiation with the ingrained nature of traditional deep structure beliefs about school often made encouraging large-scale changes in most teachers' practices difficult, if not impossible.

Conclusions

1. Changing teachers' beliefs and practices requires an informed, supportive educational community.
2. Teachers in the midst of changing beliefs and practices require consistent coaching and honest, informed feedback about their efforts.
3. Changing teachers' beliefs and practices requires substantial time.
4. Implementing differentiation benefits from a healthy school environment.
5. Changing teachers' beliefs and practices requires individual and peer reflection.
6. The most significant changes to teachers' beliefs and practices occur when teachers are intrinsically motivated to make these changes.
7. Staff development and coaching efforts should focus on ways of encouraging teachers to utilize pre-existing organizational structures and resources to begin the process of creating a responsive classroom environment.
8. Teachers in the process of changing their beliefs and practices need differentiated coaching.

9. When addressing academic diversity, teachers must recognize students' varied readiness needs.
10. Changing beliefs and practices requires teachers to confront their prior assumptions about teaching and learning.
11. Teachers need support as they attempt to address diverse student needs in a culture of accountability.

References

Beane, J. A. (1990). *A middle school curriculum: From rhetoric to reality* (2nd ed.). Columbus, OH: National Middle School Association.

Coffman, W. E. (1983). *Testing in the schools: A historical perspective.* Paper presented at the annual invitational conference of the Center for the Study of Evaluation, University of California, Los Angeles.

Ford, D. Y. (1994). *The recruitment and retention of African American students in gifted education programs: Implications and recommendations* (RBDM 9406). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Frasier, M. M., Hunsaker, S. L., Lee, J., Finley, V. S., Frank, E., Garcia, J. H., Martin, D. (1995). *Educators' perceptions of barriers to the identification of gifted children from economically disadvantaged and limited English proficient backgrounds* (Research Monograph 95216). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

George, P., & Grebin, W. (1995). Talent development and grouping in the middle grades: Challenging the brightest without sacrificing the rest. *Middle School Journal, 26*(4), 12-17.

Herman, J., & Dorr-Bremme, D. W. (1982, March). *Assessing students: Teacher's routine practices and reasoning.* Paper presented at the annual meeting of the American Educational Research Association, New York City.

Lazar-Morris, C., Polin, L., May, R., & Barry, L. (1980). *A review of the literature on test use.* Los Angeles: Center for the Study of Evaluation, University of California. (ERIC Document Reproduction Service No. ED204411)

Moon, T. R., Tomlinson, C. A., & Callahan, C. M. (1995). *Academic diversity in the middle school: Results of a national survey of middle school administrators and teachers* (Research Monograph 95124). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

National Middle School Association. (1995). *This we believe: Developmentally responsive middle schools.* Columbus, OH: Author.

Popham, W. (1994). The instructional consequences of criterion-referenced clarity. *Educational Measurement: Issues and Practices, 13*(4), 15-18, 30.

Robinson, A. (1990). Cooperation or exploitation? The argument against cooperative learning for talented students. *Journal for the Education of the Gifted, 14,* 9-27.

Rogers, K. (1991). *The relationship of grouping practices to the education of gifted and talented learners* (RBDM 9102). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Rogers, K. (1993). Grouping the gifted and talented: Questions and answers. *Roeper Review, 16,* 8-12.

Sapon-Shevin, M. (1994). *Playing favorites: Gifted education and the disruption of community.* Albany, NY: State University of New York Press.

Sapon-Shevin, M. (1995). Why gifted students belong in inclusive schools. *Educational Leadership, 52,* 64-68, 70.

Sicola, P. (1990). Where do gifted students fit? An examination of middle school philosophy as it relates to ability grouping and the gifted learner. *Journal for the Education of the Gifted, 14,* 37-39.

Stiggins, R. J. (1999a). Assessment, student confidence, and school success. *Phi Delta Kappan, 81,* 191-198.

Stiggins, R. J. (1999b). Evaluating classroom assessment training in teacher education programs. *Educational Measurement: Issues and Practices, 18,* 23-27.

Stiggins, R. J., & Bridgeford, N. J. (1982). *Final research report on the nature, role and quality of classroom performance assessment*. Portland, OR: Northwest Regional Educational Laboratory.

Stiggins, R. J., Griswold, M. M., & Wikelund, K. R. (1989). Measuring thinking skills through classroom assessment. *Journal of Educational Measurement, 26,* 233-246.

Tomlinson, C. (1992a). Gifted education and the middle school movement: Two voices on teaching the academically talented. *Journal for the Education of the Gifted, 15,* 206-238.

Tomlinson, C. (1992b). Gifted learners: The boomerang kids of middle school? *Roeper Review, 16,* 178-182.

Wiggins, G., & McTighe, J. (1998). *Understanding by design.* Alexandria, VA: Association for Supervision and Curriculum Development.

Table of Contents

ABSTRACT v

EXECUTIVE SUMMARY vii

CHAPTER 1: Introduction and Overview 1
- Statement of the Problem 1
- Purpose of the Study 3
- Definition of Terms 4

CHAPTER 2: Review of the Literature 7
- Adolescent Development 7
- Diversity Among Middle Level Learners 8
  - Academic Diversity 9
  - Cultural Diversity 9
- Principles and Realities for Diverse Groups 10
  - Gifted Learners 10
  - Students With Disabilities 11
  - Culturally Diverse Learners 12
- Middle School and Gifted Education: Equity and Excellence 13
  - Middle School Philosophy 14
  - Slowly Building Bridges and Finding Common Ground 15
  - Current Instructional Practices in Middle School 16
- Philosophical Underpinnings of the Intervention 17
- Theoretical Support for Differentiation 18
  - Readiness 18
  - Constructivism 19
  - Intelligence Theories 20
  - Interest 20
  - Learning Profiles 22
  - Characteristics of Differentiated Instruction 23
  - Rationale for Differentiated Instruction in the Middle School 24
- Treatment Two: Differentiated Authentic Assessment 26
  - Characteristics of Authentic Assessment 27
  - Rationale for Differentiated Authentic Assessment 28
- Staff Development 29
- Change in Schools 30
  - Paradigms for Change 31
    - Gradual/Incremental Paradigms 31
    - Universal Stage Paradigm 33
  - Barriers to Change in Schools 34
  - Measuring Change in Schools 34
- School Reform and Accountability 35
  - State Testing 36
- Conclusions 38

Table of Contents (continued)

CHAPTER 3: Methodology 41
Research Questions 41
Teacher Questions 41
Student Questions 41
Study Design 42
Sample 42
States 42
Schools 43
Teacher Demographics 43
Teacher Attrition 43
Demographics of Student Cohort Groups 50
Student Attrition Rates 50
Student Cohort 1 52
Student Cohort 2 56
Student Cohort 3 58
Qualitative 61
Instrumentation 62
Middle School Teacher Questionnaire 62
Student Tests and Questionnaires 63
Iowa Tests of Basic Skills 63
Arlin-Hills Attitude Surveys 63
Self Description Questionnaire 64
Content Questionnaires 64
Observation and Interview Protocols 64
Teacher Interview and Observation Protocols 64
Administrator Interview Protocols 65
Student Interview Protocols 65
Data Collection 65
Quantitative 65
Qualitative 66
Student Interviews 67
Teacher Observation and Interviews 67
Teacher Coaching 67
Administrator Interviews 68
Criteria for Trustworthiness 68
Prolonged Engagement 68
Persistent Observation 68
Triangulation 69
Peer Debriefing 69
Referential Adequacy 70
Data Analysis 70
Quantitative 70
Teacher Questionnaire Data 70
Achievement Data 71

Table of Contents (continued)

Attitude Data 71
Self-concept Data 71
Content Surveys 71
Qualitative 71

CHAPTER 4: Quantitative Findings 75
Student Tests and Questionnaires 75
Achievement 77
Cohort 1 Students 77
Cohort 2 Students 81
Cohort 3 Students 83
Achievement 83
Attitudes Toward School 88
Cohort 1 Students 88
Cohort 2 Students 90
Cohort 3 Students 92
Self-concept 95
Cohort 1 Students 95
Cohort 2 Students 97
Cohort 3 Students 97
Teacher Questions 100
Middle School Teacher Results 100
Pre-assessment Practices 100
Use of Pre-assessment Data 100
Instructional Practices 103
Factors in Determining Content to Be Taught 103
Influence of Academic Needs of Student Sub-groups 103
Use of Particular Instructional Activities 106
Use of the Classroom Accommodations 106
Use of Student Grouping Arrangements 110
Influence on Teacher Willingness to Try New Instructional Practices 112
Factors Influencing Differentiation 113
Responses to New Instructional Practice Ideas 115
Assessment of Student Outcomes 115
Assessing Achievement or Outcomes of Instruction 115
Use of Certain Types of Item Formats 117
Competency in Constructing and Using Certain Assessment Techniques 117
Factors Affecting Use of Authentic Assessments 119
Professional Development Experiences in Assessment 120
Grading Practices 121
Assessment Methods 121
Determining Criteria for Grades 124

Table of Contents (continued)

Other Academic Issues 124
Students' Perceptions of Classrooms 126
Middle School Language Arts Classrooms 126
Classroom Opportunities 126
Use of Pre-assessment Strategies 126
Use of Classroom Accommodations 126
Engagement in Classroom Activities 130
Perceptions About Classrooms 130
Factors Important in Determining Grades 130
Responsibility for Determining Grading Criteria 130
Middle School Mathematics Classrooms 137
Classroom Opportunities 137
Use of Pre-assessment Strategies 137
Use of Classroom Accommodations 137
Engagement in Classroom Activities 141
Perceptions About Classrooms 141
Factors Important in Determining Grades 141
Responsibility for Determining Grading Criteria 141
Middle School Science Classrooms 148
Classroom Opportunities 148
Use of Pre-assessment Strategies 148
Engagement in Classroom Activities 148
Instructional Arrangements 152
Perceptions About Classrooms 152
Factors Important in Determining Grades 152
Responsibility for Determining Grading Criteria 152
Middle School Social Studies Classrooms 159
Classroom Opportunities 159
Use of Pre-assessment Strategies 159
Instructional Arrangements 159
Engagement in Classroom Activities 159
Perceptions About Classrooms 164
Factors Important in Determining Grades 164
Responsibility for Determining Grading Criteria 164
Teachers' Summary 170
Discussion 174
Comparison With the 1995 Study Findings 175
Unique Findings From the Current Study 175
Students' Perceptions of Their Classrooms 176
Conclusions 176

CHAPTER 5: Qualitative Results 179
Profiles of Participating Schools 179
Greene Middle School: Differentiated Instruction Treatment 179

Table of Contents (continued)

Setting 179
Students 179
Staff 180
Administration 182
Insight From Greene: The Need for On-site Coaching 182
A Greene Teacher 184
Franklin Middle School: Differentiated Instruction Treatment 186
Setting 186
Principal 186
Coaching Teachers at Franklin 188
Three Teachers' Journeys 189
Howard Middle School: Differentiated Instruction Treatment 194
Setting 194
Principal 196
Administrators' Influence on Teacher Participation and Change 197
Howard Teachers 201
Langley Middle School: Differentiated Authentic Assessment Treatment 214
Setting 214
Principal 215
Four Teachers' Approaches 216
Rockford Middle School: Differentiated Authentic Assessment Treatment 221
Setting 221
Principal 222
Insight From Rockford 226
Rockford Teachers 227
Marshall Middle School: Differentiated Authentic Assessment Treatment 231
Setting 231
Principal 232
Two Teachers' Approaches 232
Lack of Challenging Opportunities for Bright Learners 238

CHAPTER 6: Discussion 241
Differentiated Instruction and Differentiated Performance Assessment: Perspectives on Teaching 242
Traditional Perspectives on Teaching 242
Teachers' Visions of Teaching: The Undramatic Monologue 243
Teachers' Beliefs 247
Belief #1 247
Belief #2 250
Belief #3 251
Belief #4 254

Table of Contents (continued)

Belief #5 257
Voices From the Back of the Room: Students' Perceptions of the Middle School Experience 261
Students' Perceptions of Learning in the Middle School 262
Students' Perceptions of Testing and Their Impact on Classroom Activities 265
Students' Perceptions of the Role of the Teacher 266
Teacher Identity: Adaptation—Adoption of Innovations 267
Teachers as Resisters 269
Teachers as Accessorizers 271
Teachers as Redecorators 275
Teachers as Renovators 279
Teachers' Responses to High-stakes Testing Environments 281
Teachers' Responses to the Standards: Pressure and Panic 281
Teacher Responses to the Standards: Playing the Game 283
Conclusion: What High-stakes Testing Taught Us 286
Coaching Teachers for Change 287
Roles Coaches Play: Relationships Between Coaches and Teachers 288
Coach Expectations 291
Coach Alexandra 291
Coach Bettina 292
The Influence of School Climate 293
Environmental Factors and Their Effects on Change Initiatives 293
The Principal at Howard 293
Greene Middle School 295
Rockford Middle School 297
Coaches' Experiences 298

CHAPTER 7: Conclusions and Recommendations 303
Complexities Inherent in Learning to Differentiate Instruction and Assessment 304
Teachers' Responses to Differentiated Instruction and Differentiated Assessment 306
"Surface-level Differentiation" in Differentiation of Instruction Sites 306
"Surface-level Differentiation" in Differentiation of Assessment Sites 308
"Deep Structure Differentiation" in Differentiated Instruction and Differentiated Assessment Sites 310
Factors That Support or Hinder Teachers' Journeys Toward Differentiation 311
Impact of the Study Design on Teacher Participation 311
Impact of Principals on Teacher Change 312
Impact of Principal's Response to Study on Teacher Participation 312
Principal Leadership Qualities That Supported Teacher Change 312

Table of Contents (continued)

The Impact of Contextual Factors on Teacher Implementation 314
The Impact of Teachers' Internal Factors on Use of Differentiation 314
The Alignment Between Teachers' Pre-existing Beliefs and the Philosophy of Differentiation of Instruction and Assessment 315
Impact of Teachers' Content Knowledge and Pedagogical and Classroom Management Skills 318
Impact of State Mandates on Teachers' Use of Differentiation 319
State One 319
State Two 320
State Three 321
Impact on Students 321
Considerations to Note When Interpreting Findings 322
Study Design 322
Time Span 322
Statistical Issues 322
Cautions Regarding Generalizing the Qualitative Findings 323
Recommendations 323
Significance 327

References 329

List of Tables

Table 1	Teacher Attrition Rates for Each School Participating in the Study	44
Table 2	Grade Level and Subject Area Assignment by School (Percentages)	45
Table 3	Teaching Experience and Certification Credentials by School (Percentages)	46
Table 4	Gender, Race, Teaching Satisfaction, and Student SES Levels by School (Percentages)	48
Table 5	Student Attrition Rates for Each School	51
Table 6	Cohort 1, Subset A—Student Gender by Treatment Within State	52
Table 7	Cohort 1, Subset A—Student Racial/Ethnic Group by Treatment Within State	53
Table 8	Cohort 1, Subset A—Student Gifted Status by Treatment Within State	53
Table 9	Cohort 1, Subset B—Student Gender by Gender by Treatment Within State	54
Table 10	Cohort 1, Subset B—Student Racial/Ethnic Group by Treatment Within State	55
Table 11	Cohort 1, Subset B—Students Gifted Status by Treatment Within State	55
Table 12	Cohort 2—Student Gender by Treatment Within State	57
Table 13	Cohort 2—Student Racial/Ethnic Group by Treatment Within State	57
Table 14	Cohort 2—Student Gifted Status by Treatment Within State	58
Table 15	Cohort 3—Student Gender by Treatment Within State	59
Table 16	Cohort 3—Student Racial/Ethnic Group by Treatment Within State	59
Table 17	Cohort 3—Student Gifted Status by Treatment Within State	60
Table 18	Cohort 1, Subset A—Estimated Marginal Means, Standard Errors, and Unadjusted Post Means for States With Significantly Different Achievement Patterns	78

List of Tables (continued)

Table 19	Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns	80
Table 20	Cohort 2—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns	82
Table 21	Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns	84
Table 22	Cohort 1, Subset A—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	88
Table 23	Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	89
Table 24	Cohort 2—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	91
Table 25	Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	93
Table 26	Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	96
Table 27	Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns	98
Table 28	Use of Pre-assessment Methods	101
Table 29	Use of Pre-assessment Information	102
Table 30	Factors in Determining Instructional Content	104
Table 31	Ratings and Rankings of Influence of Student Group on Instructional Decision-making	105
Table 32	Percentage of Teachers' Reported Use of Particular Instructional Strategies	107
Table 33	Percentage of Teachers Reporting Use of Particular Strategies to Accommodate Student Needs	109
Table 34	Use of Student Groupings	111

List of Tables (continued)

Table 35	Percentage of Teachers Reporting Willingness to Try Instructional Practices	112
Table 36	Factors That Impact Differentiation	114
Table 37	Receptiveness to New Practices	115
Table 38	Use of Assessment Strategies	116
Table 39	Percentage of Teachers Reporting Use of Item Formats in Tests	117
Table 40	Competence in Assessment Techniques	118
Table 41	Factors That Affect the Use of Authentic Assessment	120
Table 42	Opportunities to Learn About Assessment	121
Table 43	Importance of Factors in Grading	122
Table 44	Importance of Factors in Grading	123
Table 45	Key Determinants of Grading Criteria	124
Table 46	Variety of Academic Issues	125
Table 47	Students' Perceptions of Opportunities in Language Arts Classrooms	127
Table 48	Students Reporting the Use of Pre-assessment Methods in Language Arts Classrooms	128
Table 49	Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Language Arts Classrooms	129
Table 50	Engagement in Instructional Activities Reported by Students in Language Arts Classrooms	131
Table 51	Students' Perceptions of Their Language Arts Classrooms	132
Table 52	Students' Perceptions of the Importance of Certain Factors in Determining Grades in Language Arts Classrooms	135
Table 53	Individual Responsible for Grading Criteria in Language Arts Classrooms as Reported by Students	136

List of Tables (continued)

Table 54	Students' Perceptions of Opportunities in Mathematics Classrooms	138
Table 55	Students' Reporting of the Use of Pre-assessment Methods in Mathematics Classrooms	139
Table 56	Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Mathematics Classrooms	140
Table 57	Engagement in Instructional Activities Reported by Student in Mathematics Classrooms	142
Table 58	Students' Perceptions of Their Mathematics Classrooms	143
Table 59	Students' Perceptions of the Importance of Certain Factors in Determining Grades in Mathematics Classrooms	146
Table 60	Individual Responsible for Grading Criteria in Mathematics Classrooms as Reported by Students	147
Table 61	Students' Perceptions of Opportunities in Science Classrooms	149
Table 62	Students' Reporting of the Use of Pre-assessment Methods in Science Classrooms	150
Table 63	Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Science Classrooms	151
Table 64	Engagement in Instructional Activities Reported by Students in Science Classrooms	153
Table 65	Students' Perceptions of Their Science Classroom	154
Table 66	Students' Perceptions of the Importance of Certain Factors in Determining Grades in Science Classrooms	157
Table 67	Individual Responsible for Grading Criteria in Science Classrooms as Reported by Students	158
Table 68	Students' Perceptions of Opportunities in Social Studies Classrooms	160
Table 69	Students' Reporting Use of Pre-assessment Methods in Social Studies Classrooms	161

List of Tables (continued)

Table 70	Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Social Studies Classrooms	162
Table 71	Engagement in Instructional Activities Reported by Students in Social Studies Classrooms	163
Table 72	Students' Perceptions of Their Social Studies Classroom	165
Table 73	Students' Perceptions of the Importance of Certain Factors in Determining Grades in Social Studies Classroom	168
Table 74	Individual Responsible for Grading Criteria in Social Studies Classrooms as Reported by Students	169
Table 75	Middle School Classrooms: Teachers' Practices and Similar Students' Perceptions of Practices as Reported by the Majority of Teachers and Students	171
Table 76	Middle School Classrooms: Teachers' Practices and Dissimilar Students' Perceptions of Practices as Reported by the Majority of Teachers and Students	173
Table 77	Deep Structure Beliefs	305

List of Figures

Figure 1	Study Design: Student Cohorts	76
Figure 2	Summary of Significant Differences Across States and Achievement Tests	86
Figure 3	Summary of Significant Differences Across States and Attitude Assessments	94
Figure 4	Summary of Significant Differences in Self-concept Across States	99

The Feasibility of High-end Learning in a Diverse Middle School

Catherine M. Brighton
Holly L. Hertberg
Tonya R. Moon
Carol A. Tomlinson
Carolyn M. Callahan
University of Virginia
Charlottesville, Virginia

CHAPTER 1: Introduction and Overview

This project was an investigation of staff development programs designed to provide teachers with strategies through which all learners, including gifted, minority, and limited-English proficient students, can be appropriately served in a middle school environment sensitive to diverse learner academic needs. Participants in the study were assigned to either one of two experimental groups (Differentiated Instruction or Differentiated Authentic Assessment) or to a comparison group. Using a concurrent mixed method design, data were collected and analyzed relating to (a) the effects on teachers and students of a staff development program focusing on differentiated instruction, and (b) the effect on teachers and students of a staff development program focusing on differentiated authentic assessment strategies.

Statement of the Problem

Americans continue to be concerned with improving education for adolescents. While discussions of educational reform in general continue in the media and in professional circles, particular issues such as ability grouping, appropriate curricular practices, standards-based assessment, adolescent development, and cultural diversity dominate educational debates about the appropriate schooling for the middle school child. Current educational practices in the middle school as they relate to curriculum, instruction, and assessment have come under scrutiny due to pressures from the standards movement in general and high-stakes testing in particular.

Historically, the emphasis in middle level education has been on creating schools that provide the same educational experience for all. A strong equity approach to schooling leads proponents of middle schools to oppose identification and grouping practices that may have a negative effect on at-risk learners. Middle school practice as abstracted from core writings of the National Middle School Association (NMSA) and research on middle school education often appears at worst hostile and at best indifferent to many concerns of gifted education (Sicola, 1990; Tomlinson, 1992a). In part, the negative atmosphere results from reluctance on the part of many leaders in the middle school movement for "identifying" learners in ways that set them apart from peers.

Identification and instruction of learners identified as gifted is also shunned by many middle school advocates, in part because of the implication that identification of some learners as highly able excludes others from rich learning opportunities often made available only to gifted learners, and in part because ability grouping is seen as disadvantageous for at-risk learners (George & Grebin, 1995). Programs for the gifted, when based on grouping according to ability, have been viewed by some as excluding learners from programs, which could have provided benefit to a wider range of students (Sapon-Shevin, 1994). Programs for the gifted have also been criticized for inadequacies in identifying and developing talent in high-ability/at-risk middle schoolers (Sapon-Shevin, 1995). Currently, standards and assessments that imply the same learning is appropriate for all students reinforce common learning experiences. Consequently, little research has been conducted on meeting the unique needs of academically diverse learners despite nearly 20 years of criticism of middle school practices that seem to deny individual differences in practice, if not in theory.

Also contributing to a general lack of focus on the needs of advanced learners among middle school educators is a belief stated in earlier middle school literature that middle schoolers are in a plateau period of brain growth that inhibits acquisition of new concepts and skills as well as abstract reasoning (Ford, 1994; Frasier et al., 1995). This belief, while later retracted in some middle school literature, persists, both in print (NMSA, 1995) and in the belief system of a large number of middle school practitioners (Moon, Tomlinson, & Callahan, 1995). This belief may have contributed to the tardiness of the middle school movement in defining what constitutes an appropriate curriculum for any early adolescent learner (Tomlinson, 1992a). Whatever the reasons, the middle school movement has only recently begun a concerted effort to describe criteria for curriculum and instruction in the middle grades (Beane, 1990). In regard to what would characterize "advanced" learning during early adolescence, the literature of middle school is virtually mute. Consequently, many educators of the gifted have expressed concern about the affective development of high-ability early adolescents if they traverse the middle school years without educator awareness and/or acceptance of their need to achieve at high levels in order to grow in self-efficacy (Robinson, 1990; Rogers, 1991, 1993; Tomlinson, 1992a, 1992b).

Perhaps because of its reluctance to elaborate on student differences, the middle school movement has also been reticent in addressing learning differences that may result from varied cultural profiles—a somewhat ironic fact given the movement's strong equity stance (Moon et al., 1995). It is not surprising, then, that information relating to high-potential minority or limited-English proficient students or students from impoverished environments are scant in the writings of the NMSA.

Over the last two decades, educational reform efforts (e.g., state accountability mandates, national goals movement) have emphasized student performance and standards. While government agencies have placed great emphasis on high-stakes testing, within the education community attention to and advocacy for authentic assessments has increased substantially. Proponents of authentic assessment argued that performance assessments provide a much clearer and more critically important picture of

student learning and progress than standardized, traditional instruments because they focus on such aspects of achievement as problem-solving, problem-finding, critical thinking, and decision-making (Wiggins & McTighe, 1998).

Although measurement is an integral part of every classroom environment, and considered an integral part of the instructional process, the narrow scope of the measurement research has resulted in little knowledge about the nature, role, and quality of assessments developed and used by teachers in the classroom (Stiggins, Griswold, & Wikelund, 1989). Lazar-Morris, Polin, May, and Barry (1980), in a comprehensive review of testing in schools, concluded:

> In-class assessments made by individual teachers have yet to be examined in depth. How these and other assessments are united with teacher instructional decision-making processes and how they affect classroom organization and time allocation to other objectives are areas that should be explored. (pp. 24-25)

Stiggins (1999a) echoes this sentiment in more recent literature:

> These are the assessments that inform the day-to-day decisions that lead to learning and that motivate learners to believe in or lose faith in and reject their own academic potential. Yet these are the assessments that we have all but ignored in our journey to school improvement. (p. 193)

Recognizing that one-third to three-quarters of assessments used in classrooms are teacher-developed (Herman & Dorr-Bremme, 1982), and that very little teacher training focuses on classroom assessment (Coffman, 1983; Stiggins, 1999b; Stiggins & Bridgeford, 1982), attention must be directed toward documenting and improving quality classroom assessments, some of which are differentiated authentic assessments. Omission of teacher-developed tests from prominent measurement research disregards the full range of measurement options available to teachers, and more importantly, it fails to help teachers produce data needed to address day-to-day instructional decisions (Stiggins & Bridgeford, 1982).

The effect of assessment on curriculum has been postulated as pervasive (Popham, 1994). In the process of examining ways to influence curriculum and instruction in middle school classrooms, it is critical to examine ways assessment strategies used by teachers interact with and influence changes made by teachers in instruction, and vice versa.

Purpose of the Study

The purpose of this research was twofold: (a) to examine the effect on teachers and students of a staff development program focusing on differentiated instruction in the heterogeneous classroom, and (b) to examine the effect on teachers and students of a staff development program focusing on differentiated authentic assessment strategies. To

understand how middle school administrators, teachers, and students respond when differentiated instruction or differentiated authentic assessment is presented as playing a major role in class routines, a three-year staff development intervention was implemented in six middle schools in three different states. The study investigated the success of strategies in which the middle school concept and principles of gifted education were joined in a staff development program aimed at helping teachers provide engaging and challenging learning for all early adolescents, including traditionally recognized high-ability learners and at-risk, high-potential learners. Differing treatments were used to probe understanding of relative effects and merits of helping middle school teachers learn to: (a) fully differentiated instruction in middle school classes vs. (b) use a range of differentiated authentic assessment strategies to understand and address varied learner needs. In addition to the qualitative data collected from coaching, interviewing, and observing in these middle schools, quantitative data were gathered in the spring and fall every year of the study. Standardized test scores, product and performance assessment data, scores on self-concept measures for academic, and general self-concept, and scores on measures of student attitudes toward learning, teachers, language arts, and mathematics were collected at the points in which students "entered" the experimental treatment and "exited" the treatment. For example, in the first implementation year of the study sixth and seventh grade students were assessed. The seventh graders were assessed in the spring of the next year (the year they left middle school), but the sixth graders were not assessed until the third year of the project (their last year of middle school). Survey data on teachers' instructional practices were collected at the beginning of the project and at the completion of the project.

Definition of Terms

For the purposes of this study, the following terms are defined below.

Differentiation (includes both differentiated instruction and differentiated assessment): the recognition and commitment to modify content, process, and/or products in response to individual student differences in readiness, learning profiles, and interests in heterogeneous classroom settings (Tomlinson, 1995a).

Authentic Assessments: academic exercises that require students to organize, synthesize, interpret, explain, and/or evaluate complex information in addressing a concept, problem, or issue that has real-life relevance (i.e., value beyond the classroom).

Middle School Students: learners in grades 6-8 in public school settings.

Gifted Learners: children and youth with outstanding talent who perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment. These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possess an unusual leadership capacity, or excel in specific academic fields (U.S. Department of Education [USDE], 1993).

At-risk Learners: groups of learners with handicaps, from low economic environments, with limited-English proficiency, and/or minorities in grades 6-8.

CHAPTER 2: Review of the Literature

Literature across several domains contributes to the body of knowledge about diverse middle level students and teachers and their experiences in schools. These include (a) adolescent development, (b) diversity among middle level learners, (c) principles and realities for diverse groups, (d) middle school and gifted education: equity and excellence. Theory and research in these areas provide a foundation for the key questions investigated in this study.

Adolescent Development

Adolescents' lives are characterized by many changes in the middle school years. Even the term used to describe youth in this time of transition is debated (George & Alexander, 1993). A variety of expressions such as "developing adolescent," "in-between-ager," "later childhood," and Eichhorn's "transescence" have emerged. Biologically, children face the rapid growth spurts, development of reproductive capabilities, changes in body shape, and increase in hormonal development associated with puberty (George & Alexander, 1993). Socially, children are more cognizant of social status, peer acceptance, opposite sex relationships, and the importance of belonging to groups (Eccles & Wigfield, 1997). In response to adolescents' need to establish a sense of identity, friendship networks often form into rigid cliques with hierarchical social status within school settings.

From Piaget's developmental perspective, children in the middle grades are in one of two stages of cognitive development—concrete operational or formal operational—or are in transition between the two stages (Wadsworth, 1989). Children in the concrete operational stage are able to perform high levels of mental manipulation, classification, and analysis, but these operations can only be performed with concrete objects or experiences. When children transition into the formal operational stage, they gain the ability to reconcile abstract and hypothetical situations calling for deductive and logical reasoning and problem solving, become more facile with considering alternative perspectives, and begin to engage in metacognition (Muth & Alvermann, 1999). These cognitive shifts occur over time, vary from child to child, and are influenced by learners' experiential backgrounds (George, Lawrence, & Bushnell, 1998).

The cognitive development of adolescents and accompanying implications for schools have long been topics of debate among many researchers. Findings from Toepfer (1977) described a hiatus of brain growth in 85% of adolescents, leading to subsequent cautions to parents and educators against setting cognitive expectations of middle-level students too high.

> Continued cognitive growth in this period is unrealistic because of the hiatus in brain growth. This leads to the recommendation that middle school programs focus upon refinement of existing skills of learners during this time rather than

> forcing them into frustrating experiences of attempting to learn new cognitive skills at a time when absence of brain growth cannot support this new learning. (p. 3)

Toepfer further advises that "expectations for cognitive growth in the abstract during the middle school years are ludicrous and unachievable" (p. 6). These findings were influential in subsequent educational recommendations. The pervasive belief among many middle school educators was that adolescents between the ages of 12 and 14 experience a plateau in brain growth (Moon et al., 1995) and that educators should discontinue the mass introduction of novel cognitive skills and instead focus attention on the practice of skills already acquired (Toepfer, 1977).

More recent neurological research contradicts the earlier findings upon which Toepfer's educational recommendations were founded. Neurological researchers have discovered that there is, in fact, a subtle increase in total cerebral volume between the ages of 7 and 16, and that overall white matter shows evidence of a general increase with age (Sowell et al., 1999). The increase of white matter is integral in pruning, the process that firms up the most robust neural connections, reinforcing cognitive pathways (Suplee, 2000). The educational implications of these neurological findings are significant according to Giedd's recent study (as cited in Suplee, 2000):

> In that critical interval, he said, the rule for brain structures appears to be "use it or lose it." What we think then happens is that if a person is doing sports or academics or music, then those are the abilities that are going to be hardwired as the circuits mature. The teenage years are a kind of critical time to optimize the brain. (p. A14)

Such research seems to indicate that middle school curriculum that fails to challenge students may actually be detrimental to cognitive development.

While dispute persists among researchers about adolescent changes and their implications for schools, researchers agree that adolescent development is predictably unpredictable. Stevenson (1998) describes the changes in early adolescents as "constant but irregular" (p. 8), varying significantly among individuals in timing and intensity.

Diversity Among Middle Level Learners

Tremendous diversity exists among middle school students in terms of individual academic readiness, community experiences, learning preferences, and motivation. Additionally, developmental differences among children further expand the diversity found in middle schools. Girls and boys reach puberty at different ages; the average onset of puberty for girls is approximately 10.5 years, and for boys, approximately 12.5 years. Therefore, it is likely that girls and boys of the same chronological age will differ greatly in terms of physical and psychological development, complicating social interactions between the sexes in middle school classrooms (Eccles & Wigfield, 1997).

Within any middle school classroom, there is likely great variability from childlike to adult—in terms of appearance, physical and cognitive development, and behaviors. Consequently, more than at any other grade level, teachers in heterogeneous middle school classrooms are faced with a wide range of developmental, social, psychological, and cognitive needs, beliefs about school, and expectations for learning experiences.

Academic Diversity

The unpredictability and irregularity of cognitive, social, and physical growth in young adolescents present educators with the formidable challenge of providing appropriate learning experiences for highly diverse groups of students. However, in recent years, the detracking movement, the push for inclusion, and the nation's changing demographics have further expanded the range of students learning together in the same classroom (Fletcher, Bos, & Johnson, 1999). The typical public school classroom contains 27 children whose academic performance levels typically span more than five grade levels (Jenkins, Jewell, Leceister, Jenkins, & Troutner, 1990).

Despite the growing diversity in our nation's schools, classrooms continue to be structured in ways that fail to meet the individual needs of many students. When faced with teaching an academically diverse group of learners, teachers often plan curriculum for the whole class, gearing lessons toward students in the middle (Boudah, Deshler, Schumaker, Lenz, & Cook, 1997; Schumm & Vaughn, 1991a, 1991b, 1995; Schumm et al., 1995; Tomlinson, Moon, & Callahan, 1998; Vaughn & Schumm, 1994). This "one-size-fits-all" approach to teaching assumes that the academic needs of learning disabled (LD), gifted, limited-English proficient (LEP), and other special needs students can be met in the same way, at the same pace, and through engagement with the same materials. Such assumptions make meaningful learning unlikely for students with special needs.

Cultural Diversity

The numbers of non-White American citizens are increasing yearly, thereby increasing the cultural diversity of classrooms (Correa & Tulbert, 1991). Rising immigration rates from Latin American and Middle Eastern countries contribute to varied languages, cultural traditions, and values represented in classrooms (Correa & Tulbert, 1991). There is some evidence, according to learning style research, to suggest significant differences in the learning preferences among varied cultural groups (Dunn et al., 1990). In their comparison of the learning style preferences of adolescent, multicultural groups (African American, Chinese-American, Greek-American, and Mexican-American), researchers found significantly different patterns of among groups, most notably in the elements of learning alone, preferred by Chinese-American students versus learning with peers, preferred by African American students, versus learning through routines and patterns preferred by Mexican-American students (Dunn et al., 1990).

In a related, comparative study of the learning style preferences of gifted African American, Mexican-American, and American-born Chinese middle school students,

Ewing and Yong (1992) revealed significant ethnic differences on preferences for noise, light, visual modality, studying in the afternoon, and persistence. Gifted African American students tend to prefer visual modalities, studying in the afternoon, while gifted Mexican-American students tend to prefer kinesthetic modalities and studying in the morning. Gifted Chinese-American students tend to prefer bright light, no noise, and studying in the afternoon. Further, the analysis revealed general differences in preferences for tactile modality and intake of information. However, the authors of the above studies used multiple analysis of variance (ANOVA) procedures for comparison and it is unclear if sufficient corrections were incorporated to account for experiment-wise error. Therefore, some caution should be exercised when interpreting these results—as the findings may be somewhat exaggerated. Further, while groups tend to exhibit some predominant learning patterns and preferences, no assumptions should be made that all members of the group (or gender) align with these trends.

These two issues raise concerns about direct application of the learning style findings, but it does suggest the possibility of an additional layer of diversity among middle school students in terms of varied learning preferences among the differing cultural groups. Learning styles aside, the contemporary middle school classroom often includes multiple cultural representations, and thus, diverse cultural and educational experiences and values that further add to the diverse setting.

Responses to academic and cultural diversity in the classroom are limited. Reasons underlying the lack of a differential response may lie in many domains. One may be the individual teacher's preparation to appropriately respond. While research results yield information about how teaching and learning processes occur and about methods teachers can use to improve student motivation and achievement, teachers often continue to have very limited instructional repertoires and to teach using models they were presented with when they were in school (Cuban, 1993; Lasley & Matczynski, 1997).

Principles and Realities for Diverse Groups

Gifted Learners

Gifted learners require curriculum with high levels of abstraction, complexity, openness, transformation, and ambiguity. Curriculum for gifted students should encourage greater mental leaps and incorporate multi-faceted problems (Tomlinson, 1996). Theorists generally agree upon the principles that should direct the development of curriculum for gifted learners: emphasis on complex thinking skills; abstract concepts; advanced level content; interdisciplinary studies; a blending of content, process, and product; and cooperative efforts between students and instructors (Renzulli, 1988). Additionally, theorists agree that the curriculum should have "real world" relevance (Tomlinson, 1996). A good curriculum for the gifted must provide opportunities for students to develop and enhance their thinking skills (particularly creative/productive thinking, critical thinking, and evaluation skills), as this focus adds a dimension essential

to challenging gifted students whose capacities to use these skills are highly advanced (Borland, 1989). These complex thinking skills are required for defining and solving "real world" problems and are essential to productivity in the professional world (Schiever, 1991). However, while opportunities for independent inquiry, exploration, and discovery are crucial to powerful curriculum, they should neither be regarded as ends in themselves nor taught in isolation (Borland, 1989). Rather, they should be related to specific subject matter, encouraging students to understand the material more thoroughly, make connections, and draw new conclusions.

Despite years of advocacy for such modification to meet the needs of gifted learners, these needs continue to go largely unaddressed in the regular classroom. Surveys of teachers (Archambault et al., 1993) indicate that only minor modifications are made in the regular curriculum in response to the academic differences of gifted learners. Gifted and talented students receive no differentiation of instruction in 84% of the learning activities of which they are a part despite evidence that particular strategies are effective in addressing the academic needs of advanced learners (Reis et al., 1993). When teachers do differentiate, they tend to adapt curriculum and instruction to meet the needs of struggling learners (Moon et al., 1995; Tomlinson, 1995b; Tomlinson et al., 1995) because of the pervasive belief that "gifted kids will make it anyway." Both general middle school teachers and gifted education teachers deemed the standard middle school curriculum lacking in challenge for gifted learners (Gallagher, Coleman, & Nelson, 1995).

Students With Disabilities

To avoid the stigmatizing effects of separate classrooms, the inclusion schools movement emphasizes "delivering all services to students with disabilities in neighborhood schools and regular classes" (Hallahan, Kauffman, & Lloyd, 1999, p. 134). Modifying curriculum and instruction would seem, logically, to be supportive of students with disabilities who are included in the heterogeneity of the regular classroom. Even when educators willingly accept learners with mild disabilities into their classrooms, however, instruction is not systematically differentiated to meet their needs (Schumm & Vaughn, 1995). Teachers in inclusive classrooms are most likely to make accommodations for students with mild disabilities that amount to little more than providing reinforcement and establishing rapport with each student (Schumm & Vaughn, 1991a). When adaptations are made, the adaptations involve reducing expectations rather than modifying instruction (Deno, 1994; Fuchs & Fuchs, 1998).

Not surprisingly, but unfortunately, children in bilingual classrooms with learning disabilities are in similar circumstances.

> Students with LLD (language and learning disabilities) in bilingual education classrooms are treated much like students with LLD in general education classrooms. Like their general education peers, these students, for the most part, were taught using whole-group instruction, participated in the same classroom activities as other students in the class, and received the same materials and

> assignments (e.g., Scruggs & Mastropieri, 1996; Vaughn, Elbaum, & Schumm, 1996).
>
> [The teachers studied] were aware of the difficulty level of the work for their students with LLD but did not differentiate instruction or assignments except to take into consideration the quality and amount of work. (Fletcher et al., 1999, p. 89)

Gifted/disabled students are perhaps the most misunderstood students in classrooms, suffering dually because of their high abilities on one hand and their disabilities on the other. When regular classroom teachers were given a profile of a child and asked to determine whether or not to label the child gifted, the teachers were less likely to consider children with disabilities "gifted" than an identically described child who did not have a handicap (Minner, 1989). And, in a study of gifted/learning disabled students' school experiences, half of the participants reported having been left back in school and all reported having been negatively perceived by their teachers because of the combination of their abilities and disabilities (Reis, Neu, & McGuire, 1994). One might conclude that our current models of schooling are not serving the needs of these twice-exceptional learners.

Research indicates that students who are both gifted and disabled fare best in educational environments focusing curriculum and instruction on areas of strengths through personally-tailored educational experiences (Gentry & Neu, 1998; LaFrance, 1997; Norton, Hartwell-Hunnicutt, & Norton, 1996; Piers, 1984), while they are most at-risk in environments focusing on assessed disabilities while failing to address areas of giftedness (Whitmore, 1988). However, research indicates that most teachers tend to overlook signs of intellectual giftedness and to focus attention instead on such deficits as poor spelling, reading, and writing (Whitmore, 1985). Thus, indications are that students with multiple learning needs may find middle school classrooms lacking in multiple ways.

Culturally Diverse Learners

When planning curriculum and instruction, middle school teachers rarely recognize or consider learning characteristics exhibited by members of specific cultural groups (Moon et al., 1995). In fact, the predominately White cultural orientation of most teachers leads to classroom practices which, although well-intentioned, may be inappropriate and even detrimental to the academic, social, and/or emotional development of the culturally diverse students in their classes (Burstein & Cabello, 1989). For example, Native American children are taught within their communities to demonstrate new learning only after observing others performing successfully, practicing independently, and expressing readiness to perform (Lasley & Matczynski, 1997). This runs counter to the typical classroom in which the teacher decides who will perform and when, and in which the only successful performances students witness are those of fellow students called on before them (Lasley & Matczynski, 1997). While the goal of effective instruction is not to generalize the needs of all learners within a cultural group, it is

important for teachers to recognize a full range of learning preferences and proactively plan instruction with those in mind.

Acknowledging that our traditional model of "one-size-fits-all" teaching cannot adequately address the growing academic and cultural diversity in our middle school classrooms, we need to consider alternative models that develop the potential of all students—not just those in the middle or those in the dominant cultural group.

Middle School and Gifted Education: Equity and Excellence

Faced with the academic, cultural, and socioeconomic diversity in today's middle school classrooms, educators essentially have three options. They can attempt to reduce the amount of diversity in the classroom through homogeneous grouping of students by ability, ignore the differences between students and serve them all in the same ways in heterogeneous classrooms, or modify curriculum and instruction to meet the diverse needs of all learners in the heterogeneous classroom.

The debate over how to appropriately address academic diversity in middle schools has traditionally centered on methods of grouping students and definitions of student success. For much of the contentious history of gifted education and the middle school movement, middle school educators have opposed homogeneous grouping of students as vehemently as gifted educators have supported it. At the heart of the debate over the grouping of students is the tension between two seemingly opposing beliefs about the purpose of schooling, often referred to in the literature as equity and excellence. Proponents of the middle school movement argue that ability grouping defies the principle of equity by denying access to deeper academic content based on ability (Oakes, 1985). According to the opponents of ability grouping, this practice confers little or no benefit to high ability learners and leads to increased segregation, limited educational opportunities for the majority of students, and damage to children's social and political development (Sapon-Shevin, 1994). Middle school educators maintain that ability grouping works against our national ideology that all students are created equal and instead supports a racist and elitist division of educational opportunities, pointing to the fact that African American, Hispanic, and economically disadvantaged students are chronically over-represented in special education classes and lower educational tracks, while White, upper-class students dominate the population of advanced classes (Oakes, 1985; Rogers, 1993; Slavin, 1990; Voltz & Dooley, 1999). In essence, in this view, the existence of ability grouping reflects class differences and racial discrimination in society" (Margolin, 1994).

In contrast, various forms of homogeneous grouping have been supported as a necessary method of ensuring that gifted students are engaged with other gifted students in curriculum responsive to their advanced needs. Although the middle school movement maintains that ability grouping confers no benefits to any students (Oakes, 1985; Slavin, 1990), a substantial body of literature indicates positive results for ability grouping of academically talented students (Allan, 1991; Kulik & Kulik, 1992; Rogers, 1993).

Further, many gifted educators believe that advanced learners cannot be served appropriately in heterogeneous classrooms (Silverman, 1990), and express concern about the dearth of middle school literature focusing on practices designed to enable gifted middle school students to work at a suitably high level of academic challenge (Tomlinson, 1992b). Without homogeneous grouping and without a commitment from the middle school movement to maximizing the potential of all students within heterogeneous settings, advocates of gifted students believe the talents of our most able students are sacrificed.

Middle School Philosophy

Acknowledgement of the rapid changes that occur in students between the ages of 10 and 14 has led to an educational "middle school" philosophy focusing directly on helping these students deal with change and maturation. Consequently, in most middle schools, social and emotional development takes precedence over intellectual development, resulting in curriculum generally lacking in intellectual rigor (Lipsitz, 1984). Despite findings that middle school learners are in fact developing cognitively, beliefs that adolescents are most appropriately engaged in concrete thinking (rather than in abstract thinking), practicing existing skills, and developing socially (Quattrone, 1990) have been difficult to dispel. A 1998 national study focusing on beliefs and practices of middle school teachers and principals as they relate to academically diverse learners found that only 29% of principals and 21% of teachers agreed or strongly agreed that their students were able to think at high levels of critical thought. Just short of half of the principals (42%) and teachers (47%) believed that middle school learners were in a plateau learning period, and a large majority of principals and teachers (78% and 84%, respectively) agreed or strongly agreed that middle school learners are concrete thinkers (Tomlinson et al., 1998).

Such widespread beliefs concern advocates of middle level gifted students. Curriculum that reflects the belief that adolescents are incapable of grappling with intellectual challenge may diminish gifted students' potential to develop their intellectual capacities. Unengaging and unchallenging curriculum puts advanced learners at risk of under achievement; gifted individuals do not achieve as highly if not provided with challenging educational experiences structured at a pace commensurate with their ability levels including the capacity to think abstractly and a preference for complexity, rigor, and challenge (Lubinski & Benbow, 1995; VanTassel-Baska, 1998).

While middle school educators support equity as a means of achieving equal opportunities for every student, advocates of advanced learners stress the need for educational environments supporting the maximization of potential of all learners, including the gifted (Tomlinson, 1992a). The two visions do not immediately appear to conflict with the primary goal of the middle school movement, which is to ensure success for all students (Carnegie Council on Adolescent Development, 1989), a goal shared by educators of the gifted (Tomlinson, 1992a). However, it is in their definitions of student success that the two visions veer from a common path. Middle school educators define success as competence, or "the ability to perform a job adequately" (Spear, 1992, p. 261).

Advocates for gifted learners call for setting standards of "excellence at the level of performance of the gifted students rather than accepting definitions of success based upon performance of the norm. To do less is to foster mediocrity for highly able learners" (Tomlinson, 1994a, p. 177).

For some proponents of the middle school movement, excellence is a matter of personal student choice, and not a major goal of the middle school environment. To these educators, fostering excellence in some and competence in others seems antithetical to goals of the middle school movement (Spear, 1992). However, educators in the field of gifted education believe that supporting equity must also mean providing equity of access to growth-inducing learning experiences for all learners, including gifted learners, while simultaneously supporting individual students as they strive for personal excellence. In addition, excellence must be promoted for all learners, both in terms of personal excellence and excellence that represents exemplary performance within a particular field or discipline (Tomlinson, 1994b).

Slowly Building Bridges and Finding Common Ground

Until recently, educators of the gifted were concerned about the paucity of middle school voices recognizing and supporting the needs of gifted middle level learners (e.g., Tomlinson, 1992a, 1994a). Strong middle school emphasis on heterogeneous cooperative learning as an alternative to meeting the needs of all learners (including those identified as gifted) seems a threat to the academic progress of advanced learners during the middle years (Kulik & Kulik, 1992; Rogers, 1993; VanTassel-Baska, 1992). While cooperative learning was purported by many in the middle school movement to meet the needs of all students in diverse classrooms, there is no clear evidence that cooperative learning benefits gifted students as a group (Robinson, 1990). In heterogeneous cooperative settings, gifted learners are more likely to assume the role of teacher than of learner (Feldhusen & Moon, 1992), limiting the amount of challenge and new information available to these students. The movement to replace homogeneous classrooms with cooperative learning in the heterogeneous classroom suggested to many members of the field of gifted education that attention to varied learner needs, particularly those of the advanced learners, was, at the most, rhetorical.

Recently, the middle school movement has spoken more directly to the need to plan actively for instruction addressing the diversity of academic needs in the middle grades. *This We Believe: Developmentally Responsive Middle Level Schools* (1995), the current position paper of the NMSA, includes among its list of characteristics of "developmentally responsive" middle schools "high expectations for all" (p. 15), further stating that "effecting high academic achievement for all students . . . requires adults to start where students are, understanding their individual needs, interests, and learning styles, then fashion a substantive curriculum and pace of learning to meet individual levels of understanding" (1995, pp. 15-16).

Middle school educators have recognized the need for "curriculum that is challenging, integrative, and exploratory" (NMSA, 1995, p. 20). Teachers must adapt curriculum to challenge every learner and

> provide choices among learning opportunities, ranging from those that tax even the most gifted and talented students to those that enable the least capable to succeed with a reasonable expenditure of effort. Independent study, small group work, special interest courses, and apprenticeships are other means by which curriculum can challenge students through addressing individual needs. (NMSA, 1995, p. 22)

Curriculum that appropriately challenges all learners requires teachers to use a variety of instructional strategies, to help students use their current knowledge to understand new concepts, and to provide "learning experiences [that] capitalize on students' cultural, experiential, and personal backgrounds" (NMSA, 1995, p. 22).

The philosophies of middle school education and gifted education do share common beliefs. Both groups are proponents of curriculum and instruction that

> (1) is theme based, (2) is interdisciplinary, (3) fosters student self-direction and independence, (4) promotes self-understanding, (5) incorporates basic skills, (6) is relevant to the learner and thus based on study of significant problems, (7) is student-centered, (8) promotes student self-discovery, (9) values group interaction, (10) is built upon student interest, (11) encourages critical and creative exploration of ideas, and (12) promotes student self-evaluation. (Tomlinson, 1995c, p. 1)

Current Instructional Practices in Middle School

Despite the emerging recommendations about best practices in the middle grades, traditional practices still prevail in the classroom. What might look like innovation may actually be the familiar dressed up in new clothes. For example, the 1995 Academic Diversity Study (Moon et al., 1995) revealed that 61% of middle schools are organized by interdisciplinary teams. Theoretically, in an interdisciplinary team organization, teachers of varying subjects are grouped together to plan interdisciplinary opportunities for students. However, of these interdisciplinary teams, fewer than 4% of the responding teachers reported planning and teaching together or sharing responsibility for concepts (Moon et al., 1995).

Other researchers note the discrepancy between theoretical organization and practice, finding that middle school teachers rarely connected across disciplines, and few team-taught or collaborated on joint curriculum ventures (Pate, Homestead, & McGinnis, 1997). According to the Academic Diversity Study, lecture and drill-and-practice dominated as the chief modes of instruction (Moon et al., 1995). Cooperative learning was also identified by principals and teachers participating in the study as a frequently used instructional strategy. The vast majority of cooperative groups were configured

heterogeneously but few teachers could accurately describe a cooperative learning strategy. McEwin (1996) also reported that 90% of middle school teachers used direct instruction regularly, confirming those findings.

In the 1995 Academic Diversity Study (Moon et al., 1995), only slightly more than half of surveyed middle school teachers reported frequent use of any instructional strategies to meet the needs of academically diverse learners, reporting only breaking down work into small parts for struggling learners and incorporating varied modes of expressing learning for all. Other instructional strategies were virtually non-existent in teachers' classroom practices. Sixty-nine percent of teachers reported seldom or no use of compacting, a strategy that streamlines content for learners that have demonstrated mastery. Forty-nine percent of teachers only used tiered assignments, a strategy that incorporates tasks on multiple levels, a few times a year or less. Advance organizers, a strategy that provides a framework of the material to be learned prior to the beginning of instruction, was never used by more than a quarter of responding teachers and only a few times per year by another quarter. Interest groups, learning centers, flexible pacing of instruction, graduated rubrics, assessments built on multiple levels, and mentorships were used rarely, if ever, in middle school classrooms. Administrators reported conflicting information about the instructional strategies used by their teachers. Administrators reported frequent use of peer tutors and computer programs focusing on skills remediation as methods to meet the needs of varying learners, while teachers reported infrequent use of the strategies.

Best practices for the middle school include the use of a variety of developmentally appropriate instructional strategies (Clark & Clark, 2000; Goldsmith & Kantrov, 2000). Beyond strategies and classroom activities focused simply on acquiring student engagement and initial motivation, the goal is to integrate instructional strategies purposefully selected to elicit high quality student work (Clark & Clark, 2000).

Philosophical Underpinnings of the Intervention

The differentiated instruction and differentiated authentic assessment models used in this study are founded on the principles guiding best practices in instruction in general and as recommended by the middle school and gifted literature. First, each model encourages teachers to use a variety of instructional strategies within each discipline. Second, each encourages interdisciplinary instruction and product production, is context driven, stresses problem-solving, and allows students to pursue personal interests and find personal meaning at varying levels of depth using a variety of materials and resources. Furthermore, based on principles of learning and instruction, the models propose that content, process, and products should be differentiated according to students' readiness, interests, and/or learning profiles and suggest a range of instructional and assessment strategies useful to teachers in doing so. The models were designed to help teachers understand the important elements of curriculum design as well as those principles that ensure curriculum is effective for academically diverse learners. Use of the models is predicated upon the belief that every learner should be engaged in work that

is meaningful and tasks that are "respectful." Curriculum, instruction, and assessment that is good for learners with special needs, such as gifted learners, must derive from education that is good for all learners (Tomlinson, 1996, 1999).

Although each experimental model is based on the same theoretical underpinnings, each has a different approach in its attempt to address the academic diversity of the classroom. That is, the differentiated instruction model takes a 'front door' approach and the differentiated authentic assessment model takes a 'back door' approach. In the differentiated instruction model, the teachers focused directly on modification of instruction to meet the academic needs of learners; in the differentiated authentic assessment model, teachers were asked to focus on modifications of assessment in hopes that they would begin to make the connection among curriculum, instruction, and assessment and realize that the instruction given prior to administration of the assessment task should also be modified to meet the academic needs of learners.

Theoretical Support for Differentiation

Differentiated instruction is supported by well-constructed theories related to the need to recognize and accommodate learner differences in readiness levels, interests, and learning profiles.

Readiness

Readiness indicates a student's "entry point relative to a particular understanding or skill" (Tomlinson, 1999, p. 10) and is often used in the differentiated instruction literature in place of the more general and rigid label, "ability." Differentiated instruction is predicated upon the belief that through scaffolding, a process that involves "controlling those elements of the task that are initially beyond the learner's capability, thus permitting him to concentrate upon and complete only those elements that are within his range of competence" (Wood, Bruner, & Ross, 1976, cited in Roehler & Cantlon, 1997, p. 9), students at different readiness levels can engage in variations of similar tasks. Scaffolding occurs within each learner's zone of proximal development (Vygotsky, 1986).

Vygotsky theorized that cognitive development centers on "discussion and reasoning through social interaction" (Berk, 1991, p. 27); therefore, cognitive development requires social interaction between children and more knowledgeable members of their culture. As mentioned in the earlier discussion, Vygotsky also believed that learning takes place within a "zone of proximal development," a concept representing the relationship between a child's level of independent performance and a higher developmental level of assisted performance. "A child's level of assisted performance includes any situation in which there are improvements in the child's mental activities as a result of social interaction" (Bodrova & Leong, 1996, p. 36). "The zone of proximal development, different for every child and often varying from one discipline to another or

at different times in the learning process, is constantly changing as learners attain higher levels of thinking and knowledge" (p. 38).

Because the optimal level of support is different for each student, teachers must be well acquainted both with their students' readiness levels and with the content they are teaching. Students vary in the amount of prompting they need, and in how close or proximal the next skill or knowledge level is for them. When a student's zone of proximal development is narrow, the teacher may have to give more frequent and detailed hints (Day & Cordon, 1993). Students also differ in their ability to articulate what they are thinking and where they are having problems, making it more or less difficult for the teacher to respond appropriately. For example, there are cultural differences in the ways children interact during such exchanges (Kleifgen, 1988, cited in Hogan & Pressley, 1997).

Support for meeting the academic and social needs of students at various levels of readiness is found in theories of cognitive development, pluralistic conceptions of intelligence, and in the theoretical bases for research on creativity and motivation and the existence of cultural- and gender-related learning profiles.

Constructivism

Constructivism is a theory of cognitive development whose main proposition is that

> learning means constructing, creating, inventing, and developing our own knowledge . . . . Because none of us has had exactly the same experiences as any other person, our understandings, our interpretations, our schemata (knowledge constructs, learning) of any concept cannot be exactly the same as anyone else's. (Marlowe & Page, 1998, p. 10)

Constructivism requires active, not passive, involvement in the process of learning, and thinking rather than memorizing (Marlowe & Page, 1998; Queen, 1999). Active, meaningful learning evolves out of the relevance of what is taught to individual learners and their needs (Queen, 1999).

Dewey (cited in Marlowe & Page, 1998) believed that interaction between the learner and the environment led to a continual reconstruction of thought, best facilitated through active involvement with long-term projects related to students' own interests. Piaget (cited in Marlowe & Page, 1998) stressed that learners maintain a sense of equilibrium in relation to their environment by assimilating new knowledge into existing cognitive structures or by changing or creating new cognitive structures to accommodate information for which cognitive structures do not already exist. Cognitive growth is caused by continual constructing and reconstructing of knowledge in relation to the environment.

Bruner (cited in Marlowe & Page, 1998) stressed the need for learners to make their own discoveries using their own cognitive efforts. Thinking and rethinking about those discoveries and relating them to prior knowledge lead to new understandings. Sharan and Sharan (1992) have suggested that active construction of meaning involves "student investment in the active search for information by a collective action with peers, followed by interpretation of the information in such a way that, eventually, it can become knowledge for the students" (p. 13). Because all learning is viewed as a highly active, highly individual process in constructivist classrooms, differences among students are naturally acknowledged and supported.

Intelligence Theories

Multiple intelligence theories describe intelligence in pluralistic rather than unitary terms, arguing that learners have "different kinds of minds and therefore learn, remember, perform, and understand in different ways" (Gardner, 1991, p. 11). Gardner, for example, has identified at least eight intelligences including verbal/linguistic, logical/mathematical, kinesthetic, and musical intelligences. Intelligence is defined by Gardner as "the ability to solve problems, or to fashion products, that are valued in one or more cultural or community settings" (Gardner, 1993, p. 7). Recognition that "there are differences in learning, representing, and utilizing knowledge" challenges an educational system that assumes that "everyone can learn the same materials in the same way and that a uniform, universal measure suffices to test student learning" (Gardner, 1991, p. 12) and supports the contention that learners have very different needs in terms of intellectual challenge and readiness for learning tasks.

Sternberg (1996, 1997) also describes intelligence in pluralistic terms, theorizing that every learner possesses abilities in analytical, creative, and practical thinking (1996). He defines analytic intelligence as the possession of those skills involved in being able to "dissect a problem and understand its parts" (1997, p. 43). He defines creative, or synthetic, intelligence as insight, intuition, creativity, and the ability to cope with novel situations; and practical intelligence as being able to apply whatever analytic or creative intelligence one possesses to everyday, pragmatic situations (Sternberg, 1997). Learners vary in the degree to which they possess and are able to use each of these intelligences.

Interest

Determining students' interests and utilizing them to encourage engagement in learning increases students' motivation and sense of the relevance of their work to their lives. Theoretical support for acknowledging and accommodating students' interests in the classroom is found in research related to motivation, creativity, and talent development. Csikszentmihalyi, Rathunde, and Whalen (1993) theorize that certain conditions can be put into place to encourage what are called "flow" experiences,

> subjective state[s] that people report when they are completely involved in something to the point of losing track of time and being unaware of fatigue and of

> everything else but the activity itself. . . . The depth of involvement is something we find enjoyable and intrinsically rewarding. (p. 14)

Flow experiences are most likely to occur in situations when goals are clear, feedback relevant, and challenges and skills are in balance (Csikszentmihalyi, 1997) and may serve as catalysts for developing new levels of challenges and skills (Whalen, 1998). Students who can balance the "play" of challenge finding and the "work" of skill building should be able to use their deep interest in exploring their talents to help them to recognize new challenges which cause them to stretch just far enough ahead of current skills to "mobilize but not overwhelm psychic resources" (Csikszentmihalyi et al., 1993, p. 80).

As a result of studies on flow experiences, Whalen (1998) suggests that teachers can provide environments and learning activities that encourage flow. Secondary level students indicated that certain teacher characteristics are more likely to be associated with learning engagement that becomes a flow experience. These characteristics are demonstrated by teachers who communicate high expectations and standards while supporting student efforts, display passion and enthusiasm within their disciplines, and "spend considerable time considering how to match their students to challenges that enhance the experience of intrinsic rewards and catalyze the development of talent" (p. 27).

Intrinsic motivation has been found to lead to high levels of interest in a topic, accepting challenge, and it is also connected to students' perceptions of competence and to self-determination in what they do as a part of their learning (Fulk & Montgomery-Grymes, 1994; Harter, 1978; Vallerand, Gagne, Senecal, & Pelletier, 1994; Zimmerman & Martinez-Ponds, 1990). In a longitudinal study, Gottfried and Gottfried (1996) found that "children who find cognitive task engagement enjoyable at an early age are more likely to continue to immerse themselves in cognitive tasks, enhancing both exposure to stimulation and intellectual development" (p. 182).

Csikszentmihalyi and colleagues (1993) attempted to find out what motivates some gifted teenagers to develop their talents while others do not. Their investigation led them to recognize the powerful motivational role that enjoyment plays in the success of many talented individuals and to identify anxiety and boredom as motivational states that interfere with learning.

Research in the domains of creativity and motivation led Amabile (1996) to develop an "Intrinsic Motivation Principle of Creativity" that originally stated: "the intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental" (p. 115). Extrinsic motivation is defined as "motivation that arises from sources outside the task itself; these sources include expected evaluation, contracted-for reward, external directives, or any of several similar sources" (p. 115). The belief that extrinsic motivation has a negative effect on creativity was based on the theory that motivation controls attention and that extrinsic motivation diverts attention toward a limited goal, preventing an individual from exploring alternative ideas and solutions (Amabile, 1996). Further research by Amabile and others (e.g., Runco &

Chand, 1995, cited in Collins & Amabile, 1999) indicates that extrinsic motivation may actually have a positive effect on creativity under certain circumstances. Extrinsic motivation "is often perceived as externally controlling but can, under some circumstances, instead be perceived as informational" (Deci & Ryan, 1985, in Amabile, 1996, p. 116). When extrinsic motivators provide information that allows a person to better complete a task, such extrinsic motivation is considered to be compatible with intrinsic motivation (Collins & Amabile, 1999). In addition, the extent to which the imposition of extrinsic constraints undermines creativity varies among individuals (Amabile, 1996).

> Empirical evidence suggests that intrinsic and extrinsic motivational orientations can [also] be thought of as general and pervasive orientations toward one's work or one's activities. Thus, although the mix of intrinsic and extrinsic motives for particular tasks at particular points in time can certainly vary within the individual, it does seem to be the case that intrinsic and extrinsic motivational orientations toward one's work are general across tasks and are relatively stable. (Amabile, 1996, p. 116)

Learners differ not only in their general motivational orientations to learning activities but also in reactions to specific learning tasks. Knowing the interests of learners provides information about the motivational orientations of learners; extensive research on creativity and motivation strongly suggests that "the best way to help people to maximize their creative potential is to allow them to do something they love" (Collins & Amabile, 1999, p. 305). Students should be encouraged to select their own topics for projects, encouraged to maintain intrinsic motivation over time by engaging in discussions with parents and teachers about the excitement and joy that learning brings, and provided with extrinsic motivators at steps in the creative process when novel thinking is less likely to occur and excitement is likely to wane (Collins & Amabile, 1999).

Learning Profiles

Learning profiles are based on students' "experiences, culture, gender, genetic codes, and neurological wiring" (Tomlinson, 1999, p. 10) and include preferences for instructional environments, resources, and approaches (Dunn & Milgram, 1993). Researchers have theorized that learning styles, defined as "the conditions under which each person begins to concentrate on, process, internalize, and retain new and difficult information and skills" (Dunn, Dunn, & Treffinger, 1992, cited in Dunn & Milgram, 1993, p. 8), may account for differences in the ways in which students learn and the successes or failures they experience in particular learning environments.

> Investigations into these learning preferences indicate that rewarding students for using preferred styles on tasks is likely to lead to a greater display of the rewarded styles. More generally, a child's socialization into a value system will probably reward some styles more than others, leading to preferences for these styles. But the fact that some people retain less rewarded styles despite environmental

> pressures suggests that socialization does not fully account for the origins of styles and that there may be preprogrammed dispositions that are difficult to change. (Sternberg & Grigorenko, 1997, p. 708)

Theories and related investigations of differences in learning profiles have focused on cognition, personality, and activity (e.g., Dunn & Dunn, 1978; Grigorenko & Sternberg, 1997a; Myers & McCaulley, 1985; Renzulli & Smith, 1978, all cited in Sternberg & Grigorenko, 1997). A learning styles model developed by Dunn and Dunn (1972, 1975, 1978, 1992, & 1993, cited in Dunn & Milgram, 1993) focuses on environmental, emotional, sociological, and physiological preferences. Sternberg and Grigorenko (1997) have focused much of their research on thinking styles, defined as "preferred ways of using the abilities one has" (p. 700).

Gender differences may also contribute to differences in learning styles. Belenky, Clinchy, Goldberger, and Tarule (1986) classified procedural knowledge, or processes of sense making, into "connected knowing" (processing information in an integrative, involved, empathetic, and subjective manner) and "separated knowing"(processing information abstractly, objectively, and by maintaining distance between that which is studied and the learner). They theorize that females often prefer connected knowing, while males often prefer separated knowing.

Educational research indicates that valuing and attending to differences in students' interests, readiness levels, and learning profiles is necessary to maximizing the potential of all learners. Using differentiated instruction and differentiated authentic assessments necessitates that teachers' curricular practices be based upon understanding student differences and responding with appropriate instructional modifications to capitalize on learning potential.

Characteristics of Differentiated Instruction

Differentiated instruction seeks to organize the classroom in ways that support flexible attention to the varied learning needs of students in the classroom, with an eye toward maximizing the learning capacity of each learner. Toward that end, teachers vary content or input, process or activities, products or assessments, time, resources, and support in response to the readiness levels, interests, and learning profiles of their students (Bearne, 1996).

Effective differentiation must be rooted in high quality curriculum and instruction. Attempts to modify, adapt, or differentiate ill-conceived curriculum are unlikely to significantly benefit learners. Our best thinking suggests that high quality curriculum and instruction would have hallmarks such as (Brandt, 1998; Schlechty, 1997; Tomlinson & Allan, 2000):

1. a clear focus on the information, concepts, principles, and skills of a discipline that a professional would value,
2. coherence within and across units of study and years,

3. student engagement,
4. relevance to students' lives and worlds,
5. high level thought and application,
6. meaningful and productive collaboration,
7. choices for students and actively helps students learn to make wise learning choices,
8. encourages and supports student choice,
9. stretches students,
10. satisfies students.

Working from a platform of defensible curriculum and instruction, a teacher who differentiates curriculum and instruction will also attend to principles of effective differentiation. These principles stem from and support the intent of differentiation to actively promote access of all students to high quality learning in ways that are responsive to each student's learning needs. Exemplary differentiation:

1. is rooted in on-going assessment with the intent of gathering information about student learning in order to inform instruction,
2. blends whole class, small group, and individual instruction, tasks, and working arrangements,
3. is organic—that is, curriculum and instruction continue to change in response to the teacher's growing understanding of student needs related to instructional goals,
4. is flexible in use of time, space, materials, and support,
5. employs flexible grouping to ensure that each student regularly works with a wide range of other learners,
6. ensures that each student in work groups and in the class as a whole has a vital contribution to make to the success of the group,
7. ensures that all students have respectful tasks—that is, all tasks are interesting, engaging, and focused on the essential understandings and skills of the topic or discipline,
8. seeks to provide continual challenge to each learner, thus working with the intent to "teach up" to each student,
9. promotes and supports collaboration between teacher and students to develop a classroom that is effective, efficient, and inviting for all learners (Bearne, 1996; Tomlinson, 2001).

Rationale for Differentiated Instruction in the Middle School

For over three decades, the literature of middle school has stressed the inevitability of developmental diversity in the early adolescent population and noted a need for teachers to focus on the individual in instruction (e.g., Alexander, 1969; Alexander & George, 1981; Bondi, 1978; Carnegie Council on Adolescent Development, 1989; Currier, 1986; Eichorn, 1966). Nonetheless, some critics of middle school have suggested that a rigid and restrictive focus on the principle of heterogeneity, a persistent belief in the inability of early adolescents to think at high levels, and single-minded focus

on cooperative learning as a predominate instructional strategy have resulted in more lip service to providing high quality instruction to academically diverse learners than actual impetus for implementation of high quality instruction (e.g., Arnold, 1991, 1993; Robinson, 1990; Tomlinson, 1992a).

In more recent years, however, leaders in the middle school movement have left little doubt about their stand on proactively addressing academic diversity, and doing so in ways that promote rich, high quality instruction for all learners. A key step in this direction occurred with the publication of a NMSA (1995) position paper called *This We Believe: Developmentally Responsive Middle Level Schools*. The document notes the great variability in middle level learners of the same age—intellectually, physically, socially, emotionally, and morally. It cautions against the practice of assuming that all seventh graders, for example, will benefit from the same experiences in the same way. Further, the position paper notes that effective middle level teachers are aware of, comfortable with, and responsive to the inevitable differences in the middle level population. Such teachers, the document says, develop flexible classrooms that respond positively to academic variance. The challenge for middle grade teachers, it continues, is to provide an education that is both relevant and rigorous, while responding to the varied developmental needs of the early adolescents. This requires teachers who begin teaching where students are and who fashion a curriculum based on the interests, learning styles, and individual levels of understanding in their students.

Appropriate curriculum in middle school classrooms will, among other things (NMSA, 1995):

1. help students understand themselves and their world,
2. engage the learner,
3. address students' own questions,
4. develop current interests and establish new interests,
5. be geared to students' levels of understanding,
6. be responsive to student culture,
7. stretch students,
8. enable students to exercise increasing control over their own learning,
9. employ flexible grouping, and
10. draw on collaborative partnerships between classroom teachers and specialists in student exceptionalities and instruction.

Most recently, the need to attend wisely and consistently to academic diversity in middle grade classrooms has been emphasized in *Turning Points 2000: Educating Adolescents in the 21st Century* (Jackson & Davis, 2000). Unequivocally noting the imperative for authentic learning for all students, the authors define learning as that which is replete with worthwhile, meaningful intellectual accomplishments much like those of successful adults in a field. Further, the authors propose the imperative that teachers "attend to student differences purposefully and consistently by differentiating content, process, and product, based on learners' varying levels of readiness, interest, and learning profiles" (p. 84).

That high quality curriculum, differentiated to address the considerable variance in the middle school student population, should be hallmarks of effective middle schools seems a given. Our best understanding both of teaching and learning and of the mission of middle schools propels us in that direction. That said, however, gearing curriculum to the varied levels of understanding, interests, learning styles, and cultural backgrounds of students is a daunting task (NMSA, 1995). It requires teacher change of the highest order. One step in the direction of such change is working with teachers toward the goal of differentiated middle level instruction and learning from the experience.

Treatment Two: Differentiated Authentic Assessment

Attending to student differences in readiness, interests, and learning profiles requires educators to be aware of their students' academic strengths and needs. Curriculum, instruction, and assessment should be inherently linked; carefully designed assessments should reflect the material explored through the curriculum and provide information about students to assess levels of achievement and to guide teachers' further curricular and instructional decisions. Unfortunately, most traditional forms of assessment are designed only as the culmination of a particular unit, not as a source of information to guide further study.

Critics of traditional forms of assessment argue that "standardized, multiple-choice tests have definite limitations, are overused and over-interpreted, and are unlikely to help schools achieve the reform goals" (Archbald, 1991, p. 1). Exclusive use of traditional assessments, often in the forms of pencil and paper, multiple-choice and true/false tests, are wrought with peril for use in the middle school (Archbald, 1991; Dana & Tippins, 1993; Kennedy, 1996). While best practices in the middle school advocate teaching conceptually and assessing student understanding of these concepts, traditional standardized tests fail to focus on conceptual understanding or application. Educators reason that the test construction process itself reduces the value of these traditional tests. Cheek (1993) argues that traditional test items that test core understanding of disciplines are often discarded because they fail to discriminate among test-takers. Rather, questions that deal with peripheral details or sub-skills do a better job of discriminating among students, and are therefore the questions selected for inclusion. Others maintain that traditional assessments are incompatible with the genuine knowledge, skills, and dispositions of disciplines (Cheek, 1993; Dana & Tippins, 1993; Gordon & Bonilla-Bowman, 1996). Further, these tests cannot access the extent to which a student has mastered the entire body of knowledge surrounding a concept, only the information tested in the selected items, nor does it provide rich information about the complex thinking going on behind the scenes (Dana & Tippins, 1993). Resnick describes the imbalance between how intellective work is conducted in school and in real life: "In real life one actually engages in performances that contribute to the solution of real problems, rather than producing, on demand and in artificial situations, symbolic samples of one's repertoire of developed abilities" (Resnick, 1987, cited in Gordon & Bonilla-Bowman, 1996, p. 33).

Furthermore, traditional assessments in the middle school ignore the needs of the learners in that setting. Traditional testing requires passive involvement with the subject material, and thus, is inconsistent with the developmental needs of young adolescents (Dana & Tippins, 1993). In short, traditional assessment is increasingly being viewed as insensitive to the assessment of meaningful differences among learners and nonsynchronous with optimal learning conditions (Gordon & Bonilla-Bowman, 1996; Kennedy, 1996).

Some measurement experts believe that the alternative to traditional assessment, authentic assessment, provides better measurement than traditional forms of assessment: "performance measures have the potential for increased validity because the performance tasks are themselves demonstrations of important learning goals rather than indirect indicators of achievement" (Resnick & Resnick, 1992, cited in Shepard et al., 1995, p. 1).

Characteristics of Authentic Assessment

Authentic assessments, often called performance-based assessments, engage students in real-world tasks and scenario-based problem-solving more than traditional measures such as multiple-choice pencil and paper tests (Darling-Hammond, 1994). Authentic assessments are largely open-ended and often can be answered using multiple approaches (Reed, 1993). For maximum benefit in the middle school, these assessments should be relevant and meaningful to students (Henderson & Karr-Kidwell, 1998). Authentic assessment can take the form of performances, projects, writings, demonstrations, debates, simulations, role plays, presentations, or other sorts of open-ended tasks (Cheek, 1993; Dana & Tippins, 1993; Reed, 1993). According to Dana and Tippins (1993), authentic assessments:

1. allow students to demonstrate knowledge and skills that are worth knowing,
2. are essential, focusing on the big ideas or concepts rather than trivial micro-facts or specialized skills,
3. are in-depth in that they lead to other problems and questions,
4. are feasible and can be done easily and safely within a school and classroom,
5. focus on the ability to produce a quality product or performance, rather than a single right answer,
6. promote the development and display of student strengths and expertise—their focus is on what the student knows,
7. have criteria that are known, understood and negotiated between the teacher and student before the assessment begins,
8. provide multiple ways in which students can demonstrate they have met the criteria, allowing multiple points of view and multiple interpretations,
9. require scoring that focuses on the essence of the task and not what is easiest to score. (p. 4)

Rationale for Differentiated Authentic Assessment

Because of the tremendous diversity among the students in their care, some middle school educators advocate instruction and assessment practices that address the varying needs of their students (Jackson & Davis, 2000). For this reason, and for the reasons previously articulated in the sections on differentiated curriculum and instruction, it would be most advantageous if assessments in the middle school classroom were also differentiated to reflect the academic interest and learning profile differences of students. While providing the teacher with feedback on the level of achievement of specific goals and standards, these assessments can be constructed so that students of all levels of accomplishment can demonstrate what they know, understand, and are able to do. That is, the assessment is tailored to give all students the opportunity to be successful while still providing reliable and valid information on level of achievement. In order to address the needs of the diverse learner, the Carnegie Council on Adolescent Development (1989) calls for schools to ensure success for all students through the

> elimination of tracking by achievement level and promotion of cooperative learning, flexibility, connect schools with communities which together share responsibility for each middle grade student's success, through identifying service opportunities in the community, establishing partnerships and collaborations to ensure students' access to health and social services, and opportunities for constructive after-school activities. (pp. 9-10)

This call for action from the Carnegie Council is consistent with the implementation of differentiated authentic assessment in the middle school. Authentic assessment is evaluated according to criteria that are important in actual performance in a field of knowledge or academic discipline (Dana & Tippins, 1993). These assessments can provide the opportunity for middle level students to all work successfully on tasks of value to a particular community, yielding a truer audience for authentic feedback. By giving all students opportunities to be successful, they can see themselves as positive contributors to real-life problem solving. Through its emphasis on real-life problems and application of knowledge, skill, and understanding to authentic issues, this approach to assessment can be more easily constructed to use community resources to enrich the learning experiences as recommended by the Carnegie Council (Carnegie Council on Adolescent Development, 1989; Kennedy, 1996).

Differentiated authentic assessment can also improve teaching and learning in the middle school by preserving the integrated, complex nature of learning. In this approach, students recall learned information and utilize needed skills, but do so in the context of a real-world scenario requiring the production of new ideas in particular contexts and forms and for particular purposes. This process of problem-solving and solution-finding requires and fosters a deep understanding of the discipline as well as integration of knowledge and skills across disciplines (Archbald, 1991), a basic tenet of curriculum construction in the middle school.

In classrooms that incorporate differentiated authentic assessment, teachers serve as facilitators, rather than directors of learning, and the learning process is seen by students as important and linked to skills used in the real world (Lines, 1994). The premise underlying authentic assessment is that teachers create curricular experiences targeting specific performance skills and, as a result, they gain richer instructional information about students useful for modifying instruction for the varied needs of learners (Darling-Hammond, 1997).

Differentiated authentic assessment may also have the potential to narrow the performance gap between various cultures, and therefore, be more equitable to various cultural groups, another goal of the middle school movement (Egan & Gardner, 1992; Gordon & Bonilla-Bowman, 1996). The cultural performance gap seems to narrow when students are engaged in activities that provide various linguistic interpretation options, use materials familiar to the students, and build in engaging problem-solving tasks (Gardner, 1993).

Staff Development

While the importance of attending to the varying learning needs of students through varying tasks, expectations, and assessment approaches has vast theoretical and research support, creating classroom environments in which this is the norm is a complex and difficult task. Differentiation of curriculum, instruction, and authentic assessment requires that teachers and schools approach teaching, learning, and assessment in an entirely new way, and requires a shift in the way classrooms are organized, the manner in which teachers prepare students, and the traditional roles of students and teachers. Training teachers to create classrooms supportive of the needs and abilities of all students requires more than simply providing teachers with instructional strategies and curricular and assessment "ideas;" it involves supporting teachers as they struggle to mesh the mindset that differentiation and authentic assessment entail with existing, and often conflicting, beliefs about schooling.

Attempts to increase teachers' professional skills and pedagogical understandings through staff development efforts must recognize and respond to what teachers bring to staff development in terms of their own levels of expertise. These levels of expertise change as teachers develop their abilities to make curricular and instructional decisions and to act intuitively, moving from the novice teacher, who uses a variety of context-free rules applied inflexibly to various situations, to the expert level teacher who acts "effortlessly and fluidly" (Berliner, 1988, p. 6), utilizing deliberate analytical processes only when encountering problems or anomalies. Therefore, a first step in successful staff development is acknowledging teachers' current level of expertise along with their personal beliefs in order to expand their repertoires of effective instructional strategies, their understandings of the diverse needs of the students they teach, and their roles in overall educational improvement.

Researchers have documented that classroom teachers require technical assistance through collaborative or expert consultation in designing and implementing instruction (Fuchs, Fuchs, & Bahr, 1990; Jenkins & Leicester, 1992). Numerous models of consultation and collaboration have been proposed (Cook & Friend, 1995; DeBoer, 1995; Fuchs & Fuchs, 1993). One further method of improving transfer of learned strategies through feedback and practice that has been found to be effective is in-classroom coaching provided first by expert coaches and then by colleagues (Baker & Showers, 1984, cited in Joyce, 1990). To be effective, consultation sessions need to be followed by planning meetings, classroom visits, and post-classroom feedback to ensure that consultation plans are actually implemented and implemented appropriately (Fuchs & Fuchs, 1993). The repeated discussions associated with coaching accelerate the mastery of professional language, allowing teachers to become more precise in describing, understanding, and adopting instructional ideas (Pasch & Harberts, 1992, p. 44).

Training teachers to use instructional strategies effectively is often unsuccessful because of the difficulties in providing sustained practice and feedback (Hopkins, 1990). Research indicates that, to be optimally effective in encouraging enduring change in teacher practices, staff development must involve long-term exposure to training. In a 2-year study investigating staff development's effect on instructional decisions made by teachers, Pasch and Harberts (1992) found that long-term exposure to training increased teachers' metacognitive reflection on instruction. Teachers who participated in 2 years of staff development internalized instructional concepts and principles and their relationship to practice, whereas during the first year, a teacher's focus remained on improvement of technical skills. Achievement gains were greater in classrooms taught by teachers with 2 years of staff development than in those with 1 year. Researchers such as Good (1985) and Showers, Joyce, and Bennett (1987) have consistently found that at least 25 teaching episodes are necessary for changes in teaching behaviors (Gersten & Marks, 1998).

Change in Schools

Changing what goes on in schools has been a topic of discussion among educators and non-educators since the beginning of public education (Tyack & Cuban, 1995). There are many different approaches to enacting school change, ranging from changing the organization in an attempt to change the individual teachers (Elmore, Peterson, & McCarthey, 1996), to changing the individuals in an attempt to change the larger school organization (Bandura, 1977; Berliner, 1988; Hall, 1985).

School reform efforts that focus on mandated behavioral and procedural changes such as the current accountability movement embody the philosophy that the forced changes to the organization will trickle down to create changes for each individual within the organization. The philosophy underlying this study was that individuals must change their beliefs and practices in order to enact change in the larger organization.

Two assumptions underlie this perspective. Often it is assumed that beliefs must change before any behavior will change. The organization, comprised of many

individuals, assumes a collective group code of behavior, "the way we do things around here." The assumptions and collective beliefs that undergird an organization are described as an organization's deep structure (Gersick, 1991; Gold, 1999; Tye, 1998, 2000). To shift the deep structure of the organization, the group members have to believe that the change is worthy, the benefits great, and the risk worthwhile.

A second assumption is that the basic unit of change is the individual, not the organization. While the organization possesses collective beliefs and assumptions, many believe that individuals are the key to organizational change (Evans, 1996; Hall, 1985; Louis & Miles, 1990; Senge, 1990; Tyack & Cuban, 1995). Senge (1990) suggests that buy-in from individuals is critical to enacting systemic change. According to Senge, aligning organizational goals with individuals' beliefs about new innovations fosters "genuine commitment and enrollment rather than compliance" (1990, p. 9).

Paradigms for Change

Abundant literature exists surrounding educational change, but most can be classified into two major paradigms: gradual/incremental theories and universal stage theories. These paradigms each have unique conceptualizations, definitions, and approaches to changing beliefs and practices in education.

Gradual/Incremental Paradigms

From the gradual/incremental paradigm, change is defined as the constant but nearly imperceptible modification of a system over time (Gersick, 1991; Gold, 1999; Tyack & Cuban, 1995). This paradigm of change is perceived as the most widely accepted, yet traditional understanding of change (Gersick, 1991). Fullan, a leader from this paradigm, suggests that "change is a journey, not a blueprint" (1993, p. 24). Further, Fullan suggests that change in organizations, including schools, requires new learning, and the acquisition and mastery of this new learning requires time. Thus, change in schools and the teachers within them requires extended periods of time to (gradually and incrementally) observe modifications of teacher behaviors—a hallmark of the gradual/incremental paradigm. Theories derived from this paradigm typically involve three phases (Fullan, 1992). In the first phase, Adoption, participants are asked to question beliefs and attitudes about a new initiative in an attempt to garner agreement to change practices and secure the belief that the change is necessary. It is during this phase that participant buy-in is sought, in hopes that the changed beliefs will precede changed behaviors.

In the second phase, Implementation, participants are introduced to the behavioral elements of the model and begin gradual implementation of the components into practice. The incremental paradigm recognizes the non-linear pathways common to the journey of change and implementation is sensitive to the contextual nature of the organization (Fullan, 1991, 1992). For this reason, it is during this second phase that some modified or hybrid interpretations of the original blueprint may emerge within the system. Albert Bandura's notion of reciprocal determinism (1977) suggests that change introduced into a

context will be affected by the context as much as the context will be affected by the change efforts. From this perspective, gradual modifications over time will result from the slow and steady exchange between the context and the change effort.

In the third phase, Institutionalization, the incremental changes that result from the implementation phase become routinized and institutionalized into the culture of the organization. As the change efforts occur gradually, over time, the new idea is absorbed into the culture of the organization with little fanfare.

The gradual/incremental perspective presumes that individuals need support for the changes they seek to incorporate (Fullan, 1991). For this reason, successful organizations seek to incorporate individuals into the building of the shared vision to garner more awareness of and support for the innovation (Fullan, 1991, 1992; Senge, 1990). A critical role in building this shared vision and in the extent of change in this model is the role of the change agent. The role of the change agent in this paradigm is essential in facilitating a constant but steady progress toward the desired outcome. This person (or team) assists others in making the gradual, incremental changes necessary to move from current behaviors to desired outcomes while being cognizant of and sensitive to the context of the organization. The role of the change agent can be configured in multiple ways from a building administrator, lead teacher, or outside consultant to the school.

> The function of the change agent is to prepare and organize the school for change; to identify the areas in which staff members are weak, such as leadership skills and group decision making, and to provide the training that they need; to help the principal adapt to a new management style; to assist in the vision, mission, goals, objectives, measurements, and timetables; to identify the impediments that are peculiar to the school and help the staff recognize and overcome them; to keep the focus of activity on improved student achievement; to recognize when schools are attempting too little or too much and then to help them establish the right pace of change. (Donahoe, 1993, p. 303)

One criticism of the gradual/incremental paradigm is that the approach depends on, and often results in, only small-scale modifications of a system, a tweaking of specific elements rather than reforming the organization at the system level. Critics argue that these adaptive responses to change initiatives allow the system as a whole to remain intact, despite the small modifications occurring within the system. Donahoe (1993) critiques current school reform efforts that, in his view, change how schools function without changing the underlying culture.

> When a school implements the programs of Theodore Sizer, James Comer, or Henry Levin, something has to change in the way the school functions. But those responses—major changes that stay within the range of current custom rather than creative innovations that go beyond existing practices and procedures. Maybe an evolving series of adaptive responses will get schools where they need to go eventually, but the more likely result is . . . fatal half measures. (p. 298)

Universal Stage Paradigm

In the universal stage paradigm, change is defined as the forward movement through a universal series of stages toward a predetermined goal (Gersick, 1991; Gold, 1999). Several educational researchers from this paradigm note predictable patterns that individuals follow when adopting new behaviors (Berliner, 1988; Hall, 1985). Berliner (1988) describes distinct stages through which teachers progress in the mastery of new skills from novice to advanced beginner, competence, proficiency, and then to expertise. Another example of educational change theory based on this paradigm is the Concerns-Based Adoption Model (C-BAM). Hall (1985) describes the C-BAM as a seven-stage process, categorized into three distinct phases, in which an individual shifts the focus of concern from the self to the task to the impact on others. Phase one of the C-BAM model involves individuals progressing through three specific stages beginning at the awareness stage (stage 0). This first phase of the model focuses on readying the self for the innovation but without any actual change in behavior. In the informational stage of phase one (stage 1), the user attempts to raise awareness of and gain more information about the topic but enacts no changed behavior. In the personal stage (stage 2), the individual participates in training and prepares the self for innovation, asking questions such as, "How will this change affect or benefit me?"

Phase two focuses on the task of changing practices and involves individuals progressing through only one predicted stage of behavior, the management stage (stage 3). During this time, participants use the innovation in a ritualistic manner, and express fear of deviating from the recommended practices. Individuals in this phase of change express concern with following directions and adhering to pre-determined steps in specific sequence, rather than on the context where the new practices are implemented or the effects on others.

Phase three is characterized by concerns regarding the effects of the innovation on others and embodies three stages of development. In the first stage of this phase, consequences (stage 4), participants begin to examine how use (or non-use) of the innovation affects the stakeholders, such as how an innovation will affect students. In the next stage, collaboration (stage 5), participants widen the circle of impact, and generate concerns about relating and collaborating with peers. The most sophisticated behaviors are seen in the last stage of this phase, refocusing (stage 6), where participants begin to integrate other ideas into the innovation, refining the procedures to better match the individual's context.

A critique of the universal stage paradigm is that the philosophy is rigid, meaning the categories are inviolate and proceed in a linear sequence. Critics of this view find these approaches unforgiving of the experiences of the individuals involved. Contextual factors that often coincide with and alter the path of planned innovations are not factored into the stages of the universal stage paradigm.

Barriers to Change in Schools

To maximize the outcomes of change efforts, it is important to identify and eliminate barriers to professional growth (Fullan, 1991). Based on research of adult learning and development, Duke (1993) identified 10 personal barriers to professional growth: (a) lack of awareness; (b) disillusionment; (c) distrust; (d) pessimism; (e) high comfort level with current practice; (f) preoccupation with other concerns; (g) stress; (h) fear of failure/fear of success; (i) poor time management; and (j) impatience with the process of change.

Tyack and Cuban (1995) identified three additional human factors that may prevent sustained change from occurring in schools. First, trying to change one element of a larger system, such as only one classroom in a school, highlights the differences between the innovator and traditional educators, causing such issues as jealousies, undermining behaviors, and feelings of isolation. Second, failure to consider and enlist the support of the larger community may cause the community to sabotage the innovative efforts of educators. Third, burnout among educational reformers may yield incomplete or unfinished efforts.

> Changing basic organizational patterns created overload for teachers, for it did not simply add new tasks to familiar routines but required teachers to replace old behavior with new and to persuade pupils, colleagues, and parents and school boards to accept the new patterns as normal and desirable. (p. 108)

Tyack and Cuban (1995) recommend a two-tiered approach to successful change in schools. First, convince others of the need for change, then follow with proposals of "sure-fire solutions" (p. 112).

Measuring Change in Schools

Once change does begin to occur, new challenges emerge regarding measuring and evaluating the change process and products. Much of the discussion about change in schools seems to focus on the success or failure of reform efforts in schools, yet there is great ambiguity and little discussion about how to measure any changes that may occur. Tyack and Cuban (1995) suggest three criteria to assess the changes in schools and then critique their validity: (a) fidelity to the original design, (b) effectiveness in meeting the predetermined outcomes, and (c) longevity of efforts. While these criteria seem reasonable, there are drawbacks to strict interpretation of each criteria posed. Focusing too much attention on pre-conceived plans may ignore unintended consequences that affect change. Further, measuring success only by adhering to blueprints may not account for contextual changes or unintended negative results of the original design. Measuring success of a change effort singularly by its success in meeting predetermined outcomes can also be problematic if additional, unintended results occur. Noting only the longevity of a change effort ignores the quality of the pressure, leaving no room for recognizing short-term bursts of energy directed toward intended goals. Over time, reform efforts can evolve into entirely different projects, and on the surface, the one long-

lived change effort can be several smaller efforts that are diametrically opposite in philosophy and intent.

In the end, recognizing the complexity of the challenge, Tyack and Cuban (1995) recommend measuring the effects of change efforts through constant, multifaceted examination of the efforts and the context.

> We have suggested treating policies as hypotheses and encouraging practitioners to create hybrids suited to their context. Instead of being ready-made plans, reform policies could be stated as principles, general aims, to be modified in the light of experience, and embodied in practices that vary by school or even by classroom. (p. 83)

School Reform and Accountability

The current accountability movement in public education has historical antecedents preceding the early 1900s. Accountability languished during the 1930s and 1940s and had a minor reawakening in the late 1950s during the Sputnik reform movement (Hansen, 1993). The origin of the current wave of school reform can be traced to the early years of the 1980s. School reform, with an emphasis on educational accountability at the federal, state, and local levels, was sparked by the publication in 1983 of *A Nation At Risk*, a report of the National Commission on Educational Excellence [NCEE] (Hansen, 1993). *A Nation At Risk* urged reforms that included higher standardized test scores for grade promotion and more testing of teachers and students (Wheelock, 1995), clearly signaling new demands for accountability (Wohlstetter, 1991).

Cunningham (1991) pointed out that most educational reform plans at the beginning of the decade included the following assumptions:

1. Public schools in this country were doing an inadequate job of ensuring that students had mastered the content and acquired the skills that a student should have upon graduation.
2. The poor performance of schools could be corrected through the sort of structural changes proposed in educational reform plans.
3. Increasing the amount of testing, or changing the structure of the tests used, was a necessary component of any educational reform plan. (p. 238)

The beginning of the 1990s brought a national call for improved accountability through high standards and better assessments (Wolf, LeMahieu, & Eresh, 1992) under the assumption that American education could be galvanized by setting high standards and using new, more probing assessments to hold districts, teachers, and students accountable. Hansen (1993) notes that the accountability movement evolved based on the following three assumptions:

1. Stricter accountability requirements lead to improvements in education.

2. Meaningful educational improvements can be effected through legislatively mandated accountability.
3. The most appropriate focal point for accountability-driven reform is the individual school.

Through the years, sweeping reforms have left behind emphasis on inputs and processes, and accountability has focused on student outcomes (Hansen, 1993). However, after a recent search of the literature on effects of accountability, Hansen concluded that there is sparse evidence to sustain the belief that accountability has produced measurable or observable improvements in educational outcomes. He also concluded that as there is no compelling evidence to support the first assumption, the second assumption is irrelevant. Regarding the third assumption, California and Colorado (as examples) have in place "building-focused" accountability systems, but there appears to be no concrete evidence of their successes. While the accountability movement seems to be generating few positive educational outcomes, it is having a drastic effect on what and how educators are teaching.

Federal initiatives have been instrumental in influencing emphasis on accountability. There have been three waves of educational reform in America since the early 1980s. The first, prompted by the release of *A Nation at Risk* (NCEE, 1983), began during the Reagan administration. The second initiative, "Education 2000," was introduced during the administration of George H. W. Bush (1989-1993). The current venture, "No Child Left Behind," is a product of President George W. Bush's administration. One common theme of each of these reforms has been attention to accountability in terms of student achievement and learning outcomes rather than process. Concurrently, in addressing issues of accountability, 49 out of 50 states had mandated the implementation of statewide testing by 1999 (Council of Chief State School Officers (CCSSO), 2000). As a result, high-stakes testing has taken center stage in the evaluation of student learning with nearly all of the evaluative efforts dominated by the use of traditional objective assessments.

State Testing

To enforce accountability, the federal government and states around the country are mandating the implementation of statewide testing (CCSSO, 2000). The effectiveness of using testing as a tool for increased accountability and improved student achievement and performance is debated in the literature.

Cunningham (1991) affirms that educational testing is an obvious way to increase accountability that, in turn, is believed to be a condition likely to enhance educational (e.g., teacher, student) performance. Several studies provide evidence of an increase in student performance brought about by state testing (Matthews, 2000; National Alliance of Business, 1999; Olson, 2001; Winfield, 1990). Using the data of the NAEP tests from 1978 and 1986, Frederiksen (1994) concluded that the use of minimum competency tests (MCTs) had desirable influences on the performance of young students. In Colorado, preliminary results from school districts suggest that uniform standards not only raise

student achievement, but also close gaps between various ethnic and socioeconomic groups (Romer, 1997).

However, the literature also indicates that the widespread use of statewide mandated standardized tests negatively effects students, teachers, superintendents, schools, and the quality of curriculum and instruction in the classroom (Moon, Brighton, & Callahan, 2003). The effects of using standardized tests in making decisions about students range from student placement in the school system to access to higher education and future careers. Haladyna (1991) listed 29 uses of standardized tests, ranging from allocation of resources to school programs, evaluation of teachers, programs, individual schools, and school districts, to grouping, promotion, and graduation of students. Meaghan and Casas (1995) believe "there exists a serious risk of misuse in the reporting of individual test scores and in their application to decisions concerning the education or the employment of the youth" (p. 37).

Several studies using data from National Assessment of Educational Progress (NAEP) suggest that an overemphasis on minimum competencies might prevent students from learning the skills associated with higher order thinking (Frederiksen, 1994). Teachers and administrators indicate that the pressure associated with standardized testing forces them to compromise their ideals about good teaching and impacts their performance, behavior, and/or attitudes towards school. Teachers have reported pressure to narrow or fragment the curriculum, limit the depth of student thinking, and rush their instruction in order to cover state test content and raise test scores (Meaghan & Casas, 1995; Moon et al., 2003, Moon, Brighton, & Callahan, 2003).

Many researchers agree that overemphasis on test scores affects what and how teachers teach. Frederiksen (1994) expressed concern that "the state mandated use of minimum-competency tests (MCTs) has influenced many schools to 'teach for the test'—even to put aside the curriculum and lesson plans in order to prepare students for the MCTs" (p. 1). Meaghan and Casas (1995) indicated that where standardized tests were common, there was a tendency for teachers to teach to the tests rather than to plan in a manner most conducive to what they felt promoted student learning and understanding. A study sponsored by the National Science Foundation (NSF) found that standardized testing influences instruction, primarily negatively (Rothman, 1992, cited in Meaghan & Casas, 1995). Half of the teachers surveyed taught test taking skills, diverting energy from teaching and studying to identifying and preparing for items likely to be on the tests.

Herman and Golan (1990, 1993) sought to determine if accountability pressures drove schools to narrow their curriculum at the cost of broader student learning. In addition, the researchers were interested in determining differences, if they existed, between districts serving predominantly economically disadvantaged students and districts serving predominantly advantaged students. Teachers reported that testing substantially influenced their instructional planning. Specifically, teachers reported devising instructional plans that included all or most of the test content and test objectives. In addition, teachers reported adjusting the curriculum sequence based on what is included on the tests. The authors also reported that low socioeconomic status

(SES) schools were more influenced by testing than those of teachers in high SES schools, a finding confirmed by Moon, Callahan, and Tomlinson (2003).

Shepard and Dougherty (1991) furthered the study conducted by Herman and Golan (1990) by surveying third- through sixth grade teachers in two high-stakes testing districts on their perceptions of the influences of testing on their teaching. Seventy-five percent of the teachers reported giving greater emphasis to basic skills instruction, vocabulary lists, word recognition skills, and paper-and-pencil computation than they would if there were no state mandated tests. Further, content that was not a focus of the tests clearly suffered. Fifty percent of the teachers reported giving less emphasis to subjects not tested.

In 1990, Lutz and Maddirala studied the effect of certain Texas reform policies on teacher burnout. They found that about 9% of the teacher burnout was attributable to state mandated tests. The researchers also found that teachers appeared to be coping with these tests by teaching to the test, making them feel a loss of control over their professional lives. Relationships between teachers and students are also influenced by an overemphasis on test scores. When test scores are overemphasized, the teacher-student relationship might become adversarial, with the teacher viewed by the students as an opponent or judge rather than as an advocate (Graves, 1983; Meaghan & Casas, 1995).

In 1992, Brown examined the meanings that teachers assigned to state-mandated tests and the actions that they initiated following their interpretation of the tests. Brown found that teachers altered the scope and sequence of curriculum and eliminated concepts that were not included in the state tests, a practice known as "narrowing the curriculum." Teachers also reported reluctance to use innovative instructional strategies and mentioned the use of more traditional instructional methods due to the belief that these types of strategies would better prepare students for state tests.

Efforts to work with schools going into greater depth with concepts, integrating curricula, developing and focusing more on higher order thinking skills, or arranging scope and sequence of curriculum to meet student needs may be futile unless these efforts also address teachers' concerns about high-stakes testing.

Conclusions

The literature reviewed was used as the basis for several aspects of this study. The background provided on the growing possibilities for cooperative efforts between the middle school movement and gifted education, as well as the literature on diversity among middle level learners, needs of diverse learners, best curricular and instructional practices in the middle school, intelligence theories, and constructivism, led us to use an existing model of differentiation in the diverse middle school environment. Literature on staff development and change in schools provided the basis for using a 3-year consultation/collaboration method in training teachers to use differentiation and authentic assessments in their classrooms. Finally, the literature on accountability and high-stakes

testing led to a determination that the effects of the varying pressures of high-stakes testing environments or the proposed change should be examined in the research process.

CHAPTER 3: Methodology

Quantitative and qualitative methods were used to examine (a) attitudes and beliefs of middle school teachers related to academically diverse learners and (b) the effect of interventions on students assigned to teachers who were participating in the project, including achievement, attitudes, self-concept, and specific content areas. Specifically, data collection was designed to address the following research questions.

Research Questions

Teacher Questions

1. How do teachers' beliefs and attitudes about differentiating instruction and authentic assessment change as they increase in their understanding of the components of these instructional practices and progress through implementation in their classrooms?
2. How does learning about and implementing differentiation and authentic assessment affect teacher awareness of and interaction with learners?
3. How do teachers incorporate information from pre-assessment of students into their lesson planning and classroom routines?
4. What factors inhibit and foster teachers' implementation of differentiation and authentic assessment?
5. In what ways do teachers mesh previous images of teaching with new images as they learn about and begin to establish differentiated classrooms?
6. How do participating teachers differ in the variety of techniques they consider for assessing children in their classrooms?

Student Questions

1. Are the growth patterns for measures of achievement consistent across three different treatments (differentiation, assessment, and comparison) for each cohort of students?
2. Are the response patterns for measures of attitude consistent across three different treatments (differentiation, assessment, and comparison) for each cohort of students?
3. Are the response patterns for measures of self-concept consistent across three different treatments (differentiation, assessment, and comparison) for each cohort of students?
4. Are the response patterns of perceptions about classroom practices in specific content areas consistent across three different treatments (differentiation, assessment, and comparison) for each cohort of students?

5. How do students (including academically and culturally diverse middle school students) come to understand and respond to differentiated environments?
6. How do students come to understand and respond to authentic assessment strategies?
7. What effect does teachers' sharing their thinking (metacognition) about differentiation with students have on student understanding and acceptance of differentiated classrooms?
8. What effect does teachers' sharing their thinking (metacognition) about authentic assessment with students have on student understanding and acceptance of authentic assessment?

Study Design

Sample

States

Middle schools (grades 6-8) were invited to participate from Collaborative School Districts (CSD) of the NRC/GT based on the state testing programs in place at the time the study was planned. Schools that participated in the study represented three states. Two states were located on the East Coast and one in the Southwest. Information reported by each state's chief school officer (state superintendent) in the annual Council of Chief State School Officers (CCSSO) state assessment program survey (CCSSO, 2000) was used to create the overviews of these states' testing programs which follow. While the original intent of the study was to classify each state according to the type of accountability tied to student outcomes, it became apparent early on in the study that regardless of the type of accountability, teachers in all states perceived the assessment programs as high-stakes. Therefore, we could not clearly control for differences in the testing environments across the three states, as was the original design.

State One. This state's assessment program consisted of two state legislatively mandated components related to the middle school years: (a) assessments of the state's content standards; and (b) a norm-referenced achievement test battery. The standards-based assessments were given to middle school students in grade 8 in English, mathematics, history, science, and technology. The norm-referenced assessment was administered in the fall to all sixth graders. State officials indicated that the assessments were for instructional purposes, student accountability, and school accountability.

State Two. This state's assessment program consisted of legislatively mandated criterion-referenced exams in reading, writing, science, and social studies in grade 8. Also in place were end-of-course exams in Algebra I. State officials indicated that the primary purpose of the program was to provide an accurate measure of student achievement in these areas, with the results being used as a gauge for institutional accountability.

State Three. In state three's assessment program, eighth grade students were administered criterion-referenced performance assessments in reading, writing, language usage, math, science, and social studies. State officials indicated that the program was for instructional purposes and school accountability. In addition, high school graduation requirements included passing objective tests in reading, mathematics, and citizenship starting in grade 7.

Schools

Nine middle schools participated in the project representing 4 school districts in the 3 states described above. Schools were located in 2 small urban school districts, a large suburban school district, and a large urban school district.

Each school was designated as a treatment site: differentiation and assessment, assessment only, or comparison. Within each school, one interdisciplinary team of teachers at each grade level participated. Students who were assigned to the participating team served as the student sample. State One contained 4 schools representing each treatment (differentiation, assessment, and comparison), with the assessment treatment having 2 schools; State Two contained 3 schools, each representing a treatment; and State Three contained 2 schools, with only the differentiation and comparison treatments represented.

Teacher Demographics

Teacher Attrition

The study was designed to follow the same set of teachers in each school over a three-year span across two treatment groups, differentiated instruction or differentiated authentic assessment, and one comparison group. However, the study experienced very high attrition rates among teachers. Due to the high mobility of teachers and local redistricting efforts, some teachers were replaced each year of the study. In other cases, teachers were transferred out of the school, were transferred to another team within the school that was not participating in the study, or simply stopped participating. Table 1 presents the teacher attrition rate for each school. At the conclusion of the study there were a total of 76 teachers.

Table 1

Teacher Attrition Rates for Each School Participating in the Study

	School	Pre N	Post N	Attrition Rate
State One	Haden (C)	22	5	73%
State One	Howard (D)	28	7	75%
State One	Rockford (P)	22	15	32%
State One	Marshall (P)	27	10	63%
State Two	Cleveland (C)	28	8	71%
State Two	Franklin (D)	27	15	56%
State Two	Langley (P)	18	6	67%
State Three	Parkway (C)	20	8	40%
State Three	Greene (D)	19	2	90%

C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

Teacher demographic data are presented for each school participating in the project. In many of the schools, all teachers did not respond to all questions; therefore, percentages oftentimes do not total 100% (see Tables 2-4).

State One. This state had four schools participating in the project for a total of 99 teachers when the project began. Based on the information given by teachers in the pre-project survey, Caucasian females comprised the majority of each school's teaching force, with all grade levels and core content areas represented. The majority of teachers in each school reported at least two years teaching experience at the middle school level with most indicating that their experience was with the school participating in the project. However, less than half of the teachers in each school reported holding a 6-8 teaching certificate.

Table 2

Grade Level and Subject Area Assignment by School (Percentages)

		State One	State One	State One	State One	State Two	State Two	State Two	State Three	State Three
		Haden (C) *n*=22	Howard (D) *n*=28	Rockford (P) *n*=22	Marshall (P) *n*=27	Cleveland (C) *n*=28	Franklin (D) *n*=27	Langley (P) *n*=18	Parkway (C) *n*=20	Greene (D) *n*=19
Grade Level	6	27	54	32	22	29	19	28	10	37
Grade Level	7	23	25	23	33	21	30	39	10	32
Grade Level	8	23	21	14	30	14	4	33	5	26
Subject Area	English	23	29	32	30	11	30	33	10	26
Subject Area	Social Studies	23	32	23	15	32	15	17	5	26
Subject *Area*	Mathematics	36	36	14	15	11	22	17	5	26
Subject *Area*	Science	27	32	14	15	11	19	22	10	26

C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

Table 3

Teaching Experience and Certification Credentials by School (Percentages)

		State One	State One	State One	State One	State Two	State Two	State Two	State Three	State Three
		Haden (C) *n*=22	Howard (D) *n*=28	Rockford (P) *n*=22	Marshall (P) *n*=27	Cleveland (C) *n*=28	Franklin (D) *n*=27	Langley (P) *n*=18	Parkway (C) *n*=20	Greene (D) *n*=19
K-5 School Experience	≤ 1 yr	18	18	9	19	4	11	11	10	11
K-5 School Experience	2-5 yrs		14	9	4	11	4	11		11
K-5 School Experience	6-10 yrs		4	5	15		15			
K-5 School Experience	≥ 11 yrs	9	18	5	7		4			11
6-8 School Experience	≤ 1 yr	5	11	9	11	4	4	17	5	5
6-8 School Experience	2-5 yrs	18	18	18	26	29	30	17	5	26
6-8 School Experience	6-10 yrs	23	29	18	19	11	19	6	15	11
6-8 School Experience	≥ 11 yrs	27	32	18	30	18	30	39		26
Secondary School Experience	≤ 1 yr	9	4	14	7	4	11		10	11
Secondary School Experience	2-5 yrs	9	18	5			11	6		11
Secondary School Experience	6-10 yrs	5	11		4	7	4	6		
Secondary School Experience	≥ 11 yrs	14	4	5			4	6		5

C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

Table 3 (continued)

Teaching Experience and Certification Credentials by School (Percentages)

		State One	State One	State One	State One	State Two	State Two	State Two	State Three	State Three
		Haden (C) *n*=22	Howard (D) *n*=28	Rockford (P) *n*=22	Marshall (P) *n*=27	Cleveland (C) *n*=28	Franklin (D) *n*=27	Langley (P) *n*=18	Parkway (C) *n*=20	Greene (D) *n*=19
Current School Experience	≤ 1 yr	5	25	41	26	18	7	22	5	5
Current School Experience	2-5 yrs	32	29	18	26	29	33	39	10	63
Current School Experience	6-10 yrs	32	32		22	11	22	11	10	
Current School Experience	≥ 11 yrs	5	4	5	11	7	19	11		
Teaching Certification	K-8	14	32	23	30	25	15	17		26
Teaching Certification	6-8	18	14	9	30	11	11	22	15	5
Teaching Certification	7-12	27	21	14	15	32	41	50	25	21
Teaching Certification	Other	32	32	14	33	18	22	22		26
Highest Academic Degree	Bachelors	46	61	46	37	32	56	56	10	26
Highest Academic Degree	Masters	27	25	9	44	29	22	22	15	36

C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

Table 4

Gender, Race, Teaching Satisfaction, and Student SES Levels by School (Percentages)

		State One	State One	State One	State One	State Two	State Two	State Two	State Three	State Three
		(C) Haden *n*=22	(D) Howard *n*=28	(P) Rockford *n*=22	(P) Marshall *n*=27	(C) Cleveland *n*=28	(D) Franklin *n*=27	(P) Langley *n*=18	(C) Parkway *n*=20	(D) Greene *n*=19
Gender	Female	46	71	41	70	43	67	67	15	16
Gender	Male	27	18	14	15	14	15	11	10	47
Race/Ethnicity	Caucasian	55	86	36	70	46	70	50	25	63
Race/Ethnicity	African American	14	4	9	11	7	4	22		
Race/Ethnicity	Hispanic			5		4		6		
Race/Ethnicity	Asian/Pacific Islander						4			
Race/Ethnicity	Native American	5								
Satisfaction with Teaching	Generally Low	5	4	5		4				
Satisfaction with Teaching	Low to Medium	14	7		4	4		6		
Satisfaction with Teaching	Medium		4	9	11	4	19	11	5	5
Satisfaction with Teaching	Medium to High	27	29	18	26	25	30	50	15	5
Satisfaction with Teaching	Generally High	23	43	9	30	25	26	17	5	58
Student SES Level	Generally Low	9		23	4	4		6		
Student SES Level	Low to Medium	41	7	36	4	36	52	39	20	
Student SES Level	Medium	23	21		41	18	22	28	5	32
Student SES Level	Medium to High		54	5	30	4	4	11		37
Student SES Level	Generally High		4							

C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

When asked about their degree of satisfaction with teaching, teachers, in general, reported a medium high to generally high level of satisfaction. Overall, teachers reported that their students were from all socio-economic levels. However, teachers from the comparison school and one assessment school reported that their students represented low to middle socio-economic levels. The other assessment school and the differentiation school indicated that their students, in general, were from middle to high socio-economic levels.

Haden served as a comparison school within State One, with 22 teachers participating. Howard served as the differentiation school within State One, with 28 teachers participating. Rockford served as the first assessment school within State One, with 22 teachers participating; Marshall served as a second assessment school within State One, with 27 teachers participating.

State Two. This state had three schools participating in the project for a total of 73 teachers when the project began. Based on the information given by teachers in the pre-project survey, Caucasian females comprised the majority of each school's teaching force, with all grade levels and core content areas represented. The majority of teachers in each school reported at least two years teaching experience at the middle school level. However, less than 25% of the teachers reported holding a 6-8 teaching certificate.

When asked about their degree of satisfaction with teaching, teachers, in general, reported a medium high to generally high level of satisfaction. Teachers in all schools reported that their students generally came from low to middle socio-economic environments.

Cleveland served as a comparison school within State Two, with 28 teachers participating. Franklin served as a differentiation school within State Two, with 27 teachers participating. Langley served as an assessment school within State Two, with 18 teachers participating.

State Three. This state had two schools participating in the project for a total of 39 teachers when the project began. Based on the information given by teachers in the pre-project survey, females and males were about equally represented in the comparison school with most teachers being male in the differentiation school. Regardless of gender, all teachers reported being Caucasian. Each grade level and content area were represented in the project by both schools, with the majority of teachers reporting at least two years teaching experience at the middle school level. Less than 20% of the teachers in both schools reported holding a 6-8 teaching certificate.

When asked about their degree of satisfaction with teaching, teachers, in general, reported a medium to high level of satisfaction. No teachers reported a low level of satisfaction with teaching. When asked about the socio-economic level of their students, the differentiation school reported their students coming from middle to high socio-economic environments, while the comparison school teachers reported their students coming from low to middle socio-economic environments.

Parkway served as a comparison school within State Three, with 20 teachers participating; Greene served as a differentiation school within State Three, with 19 teachers participating.

Demographics of Student Cohort Groups

The actual implementation of the project in each school occurred over a 3-year period. Demographic data are presented within each student cohort group, aggregated by treatment condition for the variables of student gender, race/ethnicity, and gifted identification. The study was designed to follow the same set of teachers in each school with three different cohorts of students across a three-year span[1]. Cohort one was those students who participated in the study for two years (n=724). Within this cohort were two different grade levels, students beginning in grade 6 (n=352) and students beginning in grade 7 (n=372). Cohort two was those students who participated in the study for three years (n=314). This cohort was composed only of those students who entered the study as sixth graders and exited as eighth graders. Cohort three was those students who participated in the study for one year. This cohort was composed of 923 sixth graders and 74 eighth graders. One school requested that eighth grade students be tested in the first year of the project.

Student Attrition Rates

The study was designed to follow the same set of students in each school over a 3-year span across two treatment groups, differentiated instruction or differentiated authentic assessment, and one comparison group. However, there was some student attrition over the course of the study due to several factors: student mobility, transfers to non-participating teams, and redistricting of schools. Table 5 presents the student attrition rates for each cohort by each school.

[1] Cohorts were determined by the span of the project. The project existed for 3 years in a school so the 3-year cohort included students who entered sixth grade as the project began. Other cohorts were determined by their overlap with project implementation.

Table 5

Student Attrition Rates for Each School

		Cohort 1	Cohort 1	Cohort 1	Cohort 1	Cohort 2	Cohort 2	Cohort 2	Cohort 3	Cohort 3	Cohort 3
	School	Subset*	Pre	Post	Attrition Rate	Pre	Post	Attrition Rate	Pre	Post	Attrition Rate
State One	Haden (C)	A B	46 30	26 22	43% 27%	30	12	60%	25	18	28%
State One	Howard (D)	A B	96 82	53 75	45% 9%	117	72	38%	125	120	4%
State One	Rockford (P)	A B	47 81	34 61	28% 25%	93	27	71%	87	51	41%
State One	Marshall (P)	A B	108 57	90 28	17% 51%	65	18	72%	91	18	80%
State Two	Cleveland (C)	A B	76 81	44 55	42% 32%	79	39	51%	126	105	17%
State Two	Franklin ((D)	A B	111 101	53 46	52% 54%	130	46	65%	165	147	11%
State Two	Langley (P)	A B	121 118	65 59	46% 50%	87	51	41%	128	109	15%
State Three	Parkway (C)	A B	25 39	17 28	32% 28%	39	23	41%	27	27	0%
State Three	Greene (D)	A B	67 88	55 55	18% 38%	68	47	31%	152	144	5%

*A = Students who participated sixth/seventh grades
*B = Students who participated seventh/eighth grades
C = Comparison
D = Differentiated Instruction
P = Differentiated Authentic Assessment

Student Cohort 1

Cohort 1 had two sets of students. In both subsets, students in this cohort participated in the project for two complete school years. Subset A was those students who began the project as sixth graders and exited as seventh graders. These were students who were sixth graders in the fall of the first year of the project in their school. Subset B was those students who began the project as seventh graders and exited as eighth graders. These were students who were seventh graders in the fall of the first year of the project in their school.

Subset A. For each school, demographic information collected is presented in Tables 6-8. The comparison group (Haden) within State One was 77% female, 81% Caucasian, and 19% African American. All of the students were identified as gifted and talented. For the differentiation group (Howard) in State One, 27% were female, 96% Caucasian, and 4% African American. Thirty-three percent of the students had been identified as gifted and talented. Within the assessment group (Rockford, Marshall), 58% were female, 67% Caucasian, 24% African American, 4% Asian/Pacific Islander, and 1% Native American. Twenty-three percent of the students were identified as gifted and talented. Overall demographics for State One were 51% female, 78% Caucasian, 17% African American, 2% Asian/Pacific Islander, with less than 1% Native American. Thirty-seven percent of the students were identified as gifted and talented.

Table 6

Cohort 1, Subset A—Student Gender by Treatment Within State

	Females	Males
State One		
Comparison Group	20 (77)	6 (23)
Differentiation Group	15 (27)	40 (73)
Assessment Group	55 (58)	40 (42)
State Two		
Comparison Group	27 (64)	15 (36)
Differentiation Group	12 (43)	16 (57)
Assessment Group	31 (52)	29 (48)
State Three		
Comparison Group	13 (81)	3 (19)
Differentiation Group	25 (45)	30 (55)

Note: Numbers in parenthesis represent percentage

Table 7

Cohort 1, Subset A—Student Racial/Ethnic Group by Treatment Within State

	Caucasian	African American	Hispanic	Asian/ Pacific Islander	Native American
State One					
Comparison Group	21 (81)	5 (19)			
Differentiation Group	53 (96)	2 (4)			
Assessment Group	64 (67)	23 (24)	4 (4)		1 (1)
State Two					
Comparison Group	21 (50)	14 (33)		7 (17)	
Differentiation Group	17 (61)	1 (4)		10 (36)	
Assessment Group	17 (28)	41 (67)	2 (3)		1 (2)
State Three					
Comparison Group	14 (88)	2 (12)			
Differentiation Group	34 (62)	18 (33)	3 (5)		

Note: Numbers in parenthesis represent percentage and may not sum to 100 because of missing data

Table 8

Cohort 1, Subset A—Student Gifted Status by Treatment Within State

	Identified Gifted	Non-Identified
State One		
Comparison Group	26 (100)	
Differentiation Group	18 (33)	37 (67)
Assessment Group	21 (23)	71 (77)
State Two		
Comparison Group	2 (5)	40 (95)
Differentiation Group	8 (29)	20 (71)
Assessment Group	9 (15)	52 (85)
State Three		
Comparison Group	16 (100)	
Differentiation Group	55 (100)	

Note: Numbers in parenthesis represent percentage

For the comparison group (Cleveland) within State Two, 64% were female, 50% Caucasian, 33% African American, and 17% Hispanic. Only 5% of the students in the comparison group were identified as gifted and talented. Within the differentiation group (Franklin), 43% were female, 61% Caucasian, 36% Hispanic, and 4% African American. Twenty-nine percent of the students were identified as gifted and talented. For the assessment group (Langley), 52% were female, 67% African American, 28% Caucasian and 3% Asian/Pacific Islander, and 2% Native American. Fifteen percent of the students were identified as gifted and talented. Overall demographics for State Two were 54% female, 43% African American, 42% Caucasian, 13% Hispanic, and 1% Native American, with 15% of the students identified as gifted and talented.

For State Three, the comparison group (Parkway) was comprised of 81% female, 88% Caucasian, and 12% African American. All of the students were identified as gifted and talented. Within the differentiation group (Greene), 45% were female, 62% Caucasian, 33% African American, and 5% Asian/Pacific Islander. All of the students in the differentiation group were also identified as gifted and talented. Overall demographics for State Three were 54% female, 68% Caucasian, 28% African American, and 4% Asian/Pacific Islander, with all students identified as gifted and talented.

Subset B. For each school, demographic information collected is presented in Tables 9-11. Subset B was those students who began the project as seventh graders and exited as eighth graders. These were students who were seventh graders in the fall of the first year of the project in their school.

Table 9

Cohort 1, Subset B—Student Gender by Treatment Within State

	Females	Males
State One		
Comparison Group	14 (67)	7 (33)
Differentiation Group	46 (62)	28 (38)
Assessment Group	49 (58)	35 (42)
State Two		
Comparison Group	35 (70)	15 (30)
Differentiation Group	21 (46)	25 (54)
Assessment Group	35 (61)	22 (39)
State Three		
Comparison Group	15 (58)	11 (42)
Differentiation Group	25 (53)	22 (47)

Note: Numbers in parenthesis represent percentage

Table 10

Cohort 1, Subset B—Student Racial/Ethnic Group by Treatment Within State

	Caucasian	African American	Asian/ Pacific Islander	Hispanic	Native American
State One					
Comparison Group	9 (43)	12 (57)			
Differentiation Group	65(88)	6 (8)	3 (4)		
Assessment Group	64 (73)	20 (22)	4 (4)		1 (<1)
State Two					
Comparison Group	48 (96)	2 (4)			
Differentiation Group	25 (54)	5 (11)		16 (35)	
Assessment Group	18 (32)	31 (54)	4 (7)	3 (5)	1 (2)
State Three					
Comparison Group	21 (81)	4 (15)		1(4)	
Differentiation Group	20 (43)	26 (55)	1 (2)		

Note: Numbers in parenthesis represent percentage

Table 11

Cohort 1, Subset B—Student Gifted Status by Treatment Within State

	Identified Gifted	Non-Identified
State One		
Comparison Group	4 (19)	17 (81)
Differentiation Group	10 (14)	64 (86)
Assessment Group	7 (8)	82 (92)
State Two		
Comparison Group	17 (34)	33 (66)
Differentiation Group	45 (98)	1 (2)
Assessment Group	21 (37)	36 (63)
State Three		
Comparison Group	26 (100)	
Differentiation Group	32 (68)	15 (32)

Note: Numbers in parenthesis represent percentage

Within State One, 67% of the comparison group were female, 57% African American, and 43% Caucasian. Nineteen percent of the students were identified as gifted and talented. For the differentiation group, 62% were female, 88% Caucasian, 8% African American, and 4% Asian/Pacific Islander. Fourteen percent of the students were identified as gifted and talented. For the assessment group, 58% were female, 73% Caucasian, 22% African American, 4% Asian/Pacific Islander, and less than 1% Native American. Of the students participating in the assessment treatment, 8% were identified as gifted and talented. Overall demographics for State One were 61% female, 75% Caucasian, 21% African American, 4% Asian/Pacific Islander, and less than 1% Native American. Eleven percent of the students were identified as gifted and talented.

For State Two, within the comparison group, 70% were female, 96% Caucasian, and 4% African American. Thirty-four percent of the students were identified as gifted and talented. For the differentiation group, 46% were female, 54% Caucasian, 35% Hispanic, and 11% African American. Ninety-eight percent of the students were identified as gifted and talented. Within the assessment group, 61% were female, 54% African American, 32% Caucasian, 7% Asian/Pacific Islander, 5% Hispanic, and 2% Native American. Thirty-seven percent of the students were identified as gifted and talented.

Within State Three, 58% of the comparison group were female, 81% Caucasian, 15% African American, and 4% Hispanic. All of the 26 students were identified as gifted and talented. For the differentiation group, 53% were female, 55% African American, 43% Caucasian, and 1% Asian/Pacific Islander. Sixty-eight percent of the students were identified as gifted and talented. Overall demographics for State Three were 55% female, 56% Caucasian, 41% African American, and 1% Hispanic and 1% Asian/Pacific Islander. Seventy-one percent of the students were identified as gifted and talented.

Student Cohort 2

Cohort Two students were those students who participated in the project for three complete school years. These students entered the project in the fall of their sixth grade year and exited the project in the spring of their eighth grade year. Demographic information collected is presented in Tables 12-14 for States One and Two. Because of student attrition and/or redistricting, State Three had no students who participated in the project for three school years.

Within State One, for the comparison group, 86% were female, 38% Caucasian, and 50% African American. Fourteen percent of the students were identified as gifted and talented. Within the differentiation group, 57% were female, 89% Caucasian, 6% African American, and 5% Asian/Pacific Islander. Seventy-seven percent of the students were identified as gifted and talented. For the assessment group, 49% were female, 75% Caucasian, and 25% African American. Nine percent of the students were identified as gifted and talented. Overall demographics for State One included 59% female, 78% Caucasian, 18% African American, and 4% Asian/Pacific Islander, with 42% of the students identified as gifted and talented.

Table 12

Cohort 2—Student Gender by Treatment Within State

	Females	Males
State One		
Comparison Group	12 (86)	2 (14)
Differentiation Group	44 (57)	33 (43)
Assessment Group	33 (55)	27 (45)
State Two		
Comparison Group	17 (52)	16 (48)
Differentiation Group	23 (52)	21 (48)
Assessment Group	24 (48)	26 (52)

Note: Numbers in parenthesis represent percentage

Table 13

Cohort 2—Student Race/Ethnicity by Treatment within State

	Caucasian	African American	Asian/ Pacific Islander	Hispanic	Native American
State One					
Comparison Group	6 (38)	8 (50)	2 (12)		
Differentiation Group	70 (89)	5 (6)	4 (5)		
Assessment Group	48 (75)	16 (25)			
State Two					
Comparison Group	17 (52)	11 (33)		5 (15)	
Differentiation Group	23 (52)	3 (7)	2 (5)	16 (36)	
Assessment Group	20 (40)	27 (54)	1 (2)	2 (4)	

Note: Numbers in parenthesis represent percentage

Table 14

Cohort 2—Student Gifted Status by Treatment Within State

	Identified Gifted	Non-Identified
State One		
Comparison Group	2 (14)	12 (86)
Differentiation Group	59 (77)	18 (23)
Assessment Group	6 (9)	62 (91)
State Two		
Comparison Group	17 (52)	16 (48)
Differentiation Group	44 (100)	
Assessment Group	5 (10)	45 (90)

Note: Numbers in parenthesis represent percentage

Within State Two, for the comparison group, 52% were female, 52% Caucasian, 33% African American, and 15% Hispanic. Fifty-two percent of the students were identified as gifted and talented. Within the differentiation group, 52% were female, 52% Caucasian, 36% Hispanic, 7% African American, and 5% Asian/Pacific Islander. All students in this group were identified as gifted and talented. For the assessment group, 48% were female, 54% African American, 40% Caucasian, 4% Hispanic, and 2% Asian/Pacific Islander. Only 10% of the students were identified as gifted and talented.

Because of redistricting and student attrition within State Three, there were no students in this State that participated in the study for 3 years.

Student Cohort 3

Cohort Three were those students who participated in the project for only one year. Students entered the project in the fall of the sixth grade year and exited the project in the spring of their sixth grade year. These were students who participated in the project the last year that the project was in operation. Demographic information collected are presented in Tables 15-17 for each of the three states.

Table 15

Cohort 3—Student Gender by Treatment Within State

	Females	Males
State One		
Comparison Group	17 (74)	6 (26)
Differentiation Group	68 (53)	61 (47)
Assessment Group	90 (50)	91 (50)
State Two		
Comparison Group	50 (39)	77 (61)
Differentiation Group	91 (55)	75 (45)
Assessment Group	67 (50)	67 (50)
State Three		
Comparison Group	15 (56)	12 (44)
Differentiation Group	72 (47)	80 (53)

Note: Numbers in parenthesis represent percentage

Table 16

Cohort 3—Student Race/Ethnicity by Treatment Within State

	Caucasian	African American	Asian/ Pacific Islander	Hispanic	Native American
State One					
Comparison Group	14 (58)	10 (42)			
Differentiation Group	106 (76)	30 (21)	4 (3)		
Assessment Group	151 (78)	36 (19)	5 (2)		2 (<1)
State Two					
Comparison Group	80 (60)	30 (23)		22 (17)	
Differentiation Group	72 (40)	23 (13)	4 (2)	78 (44)	
Assessment Group	42 (29)	88 (62)	2 (1)	10 (7)	
State Three					
Comparison Group	19 (68)	5 (18)	2 (7)		2 (7)
Differentiation Group	107 (68)	42 (27)	7 (4)	1 (<1)	

Note: Numbers in parenthesis represent percentage

Table 17

Cohort 3—Student Gifted Status by Treatment Within State

	Identified Gifted	Non-Identified
State One		
Comparison Group	7 (29)	17 (71)
Differentiation Group	30 (21)	111 (79)
Assessment Group	40 (21)	154 (79)
State Two		
Comparison Group	13 (10)	119 (90)
Differentiation Group	51 (29)	126 (71)
Assessment Group	19 (13)	124 (87)
State Three		
Comparison Group	28 (100)	
Differentiation Group	111 (70)	47 (30)

Note: Numbers in parenthesis represent percentage

Within State One, for the comparison group, 74% were female, 58% Caucasian, and 42% African American. Twenty-nine percent of the students were identified as gifted and talented. For the differentiation group, 53% were female, 76% Caucasian, 21% African American, and 3% Asian/Pacific Islander. Twenty-one percent of the students were identified as gifted and talented. Within the assessment group, 50% were female, 78% Caucasian, 19% African American, 3% Asian/Pacific Islander, and less than 1% Native American. Twenty-one percent of the students were identified as gifted and talented. Overall demographics for State One included 52% female, 76% Caucasian, 21% African American, 3% Asian/Pacific Islander, and less than 1% Native American, with 21% of the students identified as gifted and talented.

For State Two, within the comparison group, 39% were female, 60% Caucasian, 23% African American, and 17% Hispanic. Ten percent of the students were identified as gifted and talented. For the differentiation group, 55% were female, 44% Hispanic, 40% Caucasian, 13% African American, and 2% Asian/Pacific Islander. Twenty-nine percent of the students were identified as gifted and talented. Within the assessment group, 50% of the students were female, 62% African American, 29% Caucasian, 7% Hispanic, and 1% Asian/Pacific Islander. Thirteen percent of the students were identified as gifted and talented. Overall demographics for State Two included 49% female students, 43% Caucasian, 31% African American, 24% Hispanic, and 1% Asian/Pacific Islander. Eighteen percent of the students were identified as gifted and talented.

For State Three, within the comparison group, 56% were female, 68% Caucasian, 18% African American, 7% Asian/Pacific Islander, and 7% Native American. The entire comparison group of students was identified as gifted and talented. For the differentiation group, 47% were female, 68% Caucasian, 27% African American, 4% Asian/Pacific Islander, and less than 1% Hispanic. Seventy percent of the students were identified as gifted and talented. Overall demographics for State Three included 49% female, 68% Caucasian, 25% African American, 5% Asian/Pacific Islander, and less than 1% Hispanic.

Qualitative

The study was designed to follow the same set of teachers in each school over a 3-year span across two treatment groups: differentiated instruction or differentiated authentic assessment. Due to the high mobility of teachers and redistricting within some areas, some teachers were replaced each year of the study and other teachers remained constant throughout the study as originally designed.

Target teams, one per grade level at each school, were selected by researchers, school administration, or both to serve as the primary point of contact for the grade level at each site. Criteria for selection of the target teams included racial diversity of teachers, gender diversity, representation of core content areas, and teachers' willingness to participate in the study. Target teams agreed to attend periodic professional development sessions, approximately twice per year, and to participate in quantitative and qualitative data collection, including completing surveys, observation, and coaching. Varied degrees of qualitative data were gathered from each teacher on the team depending on teachers' willingness to admit access to the classroom, and depending on needed information to further develop, refine, or revise the developing themes from the on-going data analysis.

For the purposes of research, all teachers on the targeted teams were identified as "target" teachers (research target), and were observed and interviewed at least twice per year for three years. All other teachers in the school not a part of the target teams were designated as "non-target" teachers. Some non-target teachers participated in professional development sessions based on individual teacher or administrator requests. They were only occasionally observed and interviewed as a contrast to the target teachers at each site. Small representative groups of students assigned to targeted teams (targeted students) were interviewed at least twice per year. These students represented diversity in terms of gender, race, culture, academic achievement, and school success. Attempts were made to interview the same students over the course of the year and whenever possible, over the course of multiple years.

A representative sample of the target teachers was selected for more thorough investigation through observations, interviews, student interviews, and document analysis based on diversity of implementation levels, race, gender, and subject areas. Additionally, this subset of target teachers (subset 1) received varying degrees of instructional coaching related to the site's treatment designation. The degree of coaching

varied over time in response to needs and were offered individually or in small groups of teachers depending on the target teacher's developing understanding of and ability to respond to academic diversity. All target teachers at each site received at least some degree of coaching services. At some sites, all target teachers received intensive, extended coaching. In other sites, just the smaller subset of the targeted group received intensive, extended coaching. The numbers of these target teachers receiving the coaching treatment varied over time, across sites, and in response to contextual factors (e.g., one teacher's chronic illness limited coaching opportunities, one teacher's motivation for coaching sessions increased due to increased parent pressure to meet gifted students' needs). For coaching purposes, the subset of target teachers on the targeted teams that received (or requested) coaching services were designated "coaching target" teachers. Non-target teachers did not receive coaching services. Those teachers designated as target (on the selected team at each grade level), coaching target (subset 1 of teachers on selected teams), and non-target teachers (teachers not on selected teams) from the six sites receiving treatments (e.g., differentiated instruction or differentiated authentic assessment) were the main focus of this investigation.

Instrumentation

Middle School Teacher Questionnaire

The middle school teacher questionnaire used in this study was a modification of a survey used previously in a nationwide sample of middle school teachers (Moon et al., 1995). The questionnaire contained 13 pages of questions that solicited information on (a) the background of the teacher, (b) the teacher's beliefs about classroom issues, and (c) the teacher's curriculum, instructional, and assessment practices. A variety of question formats were used to gather the information. Some questions used a 4-point Likert scale (e.g., strongly disagree to strongly agree), other questions used a 6-point graduated frequency scale (e.g., never use to use daily). For each question related to decision-making practices, two formats were used: (a) a 4-point Likert scale ranging from "Not Important" to "Very Important," and (b) a ranking format based on ranking the eight most influential factors for each decision. Because teachers tend to rate most factors as important or very important, at some point in the decision-making process factors become weighted by their relative importance. Therefore, teachers were also asked to rank the relative importance of each factor. This ranking format was used to generate variation among individual factors. Detailed descriptions of the factors for the sections indicated are provided below.

Teacher background. This section of the questionnaire contained questions related to the teacher's sex, racial/ethnic status, highest academic degree earned, type of teacher certification/endorsement held, discipline(s) and the grade level(s) the teacher was primarily responsible for teaching, and full-time teaching experience at the elementary, middle, and secondary levels.

Teacher beliefs. Questions in this section of the questionnaire addressed teacher beliefs about reasons for possible lack of learning options provided in classrooms to address academically diverse learners.

Teacher's curriculum, instruction, and assessment practices. In this section of the survey, questions were asked about the use of (a) particular instructional strategies used to address students' varied readiness levels and learning needs, (b) influence on instruction of particular types of student assessment, and (c) decision-making processes relative to curriculum, instruction, and assessment practices.

Student Tests and Questionnaires

The following section describes the achievement tests and questionnaires that were administered to students.

Iowa Tests of Basic Skills®

Eight sub-tests of the Iowa Tests of Basic Skills® ([ITBS], Form L, 1995) were used to measure student achievement across the project time span. Sub-tests given were: reading comprehension, usage and expression, math concepts and estimation (part 1 & 2), math problem solving and data interpretation (part 1 & 2), social studies, science, maps and diagrams, and reference materials. Reported KR-20 coefficients were .90 (reading comprehension), .86 (usage and expression), .88 (math concepts & estimation), .84 (math problem solving and data interpretation), .87 (social studies), .83 (science), .81 (maps and diagrams), and .88 (reference materials).

Arlin-Hills Attitude Surveys

Questionnaires from the Arlin-Hills Attitude Surveys (Arlin & Hills, 1976) were used to measure student attitudes towards learning processes, teachers, language arts, and mathematics. Each 15-item instrument asked students to respond on a 4-point Likert scale to items pertaining to their attitudes about classroom activities and teachers. For each instrument the total score ranges from 0 (low) to 60 (high) with a value of 30 or higher indicating a positive attitude (Arlin & Hills, 1976).

The Attitudes Toward Learning Processes survey assesses a student's perception of his or her degree of participation in a variety of classroom activities, such as the amount of homework he/she receives or the number of opportunities to work with friends throughout the day. The internal consistency estimate reported by the authors for this survey was .90 across grades 1 through 12.

In the Attitudes Toward Teachers survey, students respond to items about their teachers, including such items as their perceptions of their teachers' fairness and attitudes. The internal consistency estimate reported by the authors for this survey was .86 across grades 1 through 12.

The Attitudes Toward Language Arts survey includes items such as how difficult students perceive language arts class to be and how much they like it. The internal consistency estimate reported by the authors for this survey was .83 across grades 1 through 12.

The Attitudes Toward Math survey assesses a student's perception of his or her math class with items reflecting several factors, such as how difficult math is and how much they like it. The internal consistency estimate reported by the authors for this survey was .88 across grades 1 through 12.

Self Description Questionnaire

The Self Description Questionnaire II (SDQ-II) (Marsh, 1990) is a multidimensional instrument designed to measure self-concept in younger adolescents. The 102-item SDQ-II assesses three areas of academic self-concept (Reading, Mathematics, and General School), seven areas of nonacademic self-concept, and general self-concept (Marsh, 1990). Students are asked to respond to declarative sentences (e.g., "I am good looking," "I worry a lot") with one of six responses: False; Mostly False; More False than True; More True than False; Mostly True; or True. The internal consistency reliability estimate reported by the author for this total instrument was .94. Internal consistency estimates for the scales used in this study were .92 for math, .88 for verbal, and .89 for general school.

Content Questionnaires

These questionnaires were developed to assess students' perceptions of language arts, math, science, and social studies. All questionnaires contained the same items, varied only by specific content area of focus. Several items on these questionnaires paralleled those on the survey given to teachers in order to assess the students' perceptions on the same issues that we had presented to the teachers. The initial questionnaires were piloted in January 1996 with a sample of Virginia middle school students. Students' feedback on the questionnaires resulted in several revisions to clarify particular items.

Observation and Interview Protocols

The following section describes the observation and interview protocols used with teachers, administrators, and students.

Teacher Interview and Observation Protocols

Observer-coaches used semi-structured protocols to guide interviews and observations. Areas of focus included: (a) teacher planning, classroom organization, and management; (b) curriculum, instruction, and assessment beliefs and practices; (c) teacher knowledge of content and pedagogy; (d) administrative support and district-imposed influences; (e) student issues (academic, cultural, and/or social); and (6)

contextual factors, events, and circumstances (e.g., school-wide concerns, local events). Other topics emerged and were investigated based on individual teachers' experiences, beliefs, and contexts.

Administrator Interview Protocols

Administrator interviews occurred approximately once per year, although some administrators were interviewed more frequently, either formally or informally, as needed to investigate emerging themes. Observer-Coaches used semi-structured protocols to guide interviews with administrators. Areas of focus included: (a) perception of teacher planning, classroom organization, and management; (b) perception of curriculum, instruction, and assessment beliefs and practices; (c) perception of teacher knowledge of content and pedagogy; (d) district-imposed influences; and (e) contextual factors, events, and circumstances (e.g., school-wide concerns, local events). Other topics emerged and were investigated based on contextual events and classroom experiences.

Student Interview Protocols

Students from target teachers' classrooms were interviewed approximately twice per year to gain additional insights into teachers' practices, contextual factors, and students' response to classroom practice. Observer-Coaches used semi-structured protocols to guide interviews with students. Areas of focus included: (a) general perception of the school and target teachers; (b) perception of curriculum, instruction, and assessment practices; (c) students' perception of the role of a teacher; (d) students' perception of the level of challenge at the school and in specific classes; and (e) contextual factors, events, and circumstances (e.g., school-wide concerns, local events). Other topics emerged and were investigated based on contextual events and observed or discussed classroom experiences.

Data Collection

Quantitative

Teacher questionnaire. All teachers participating in the study were asked to complete the Middle School Teacher Questionnaire (MSTQ) prior to the project beginning or during their first year if they did not start in the first year of the project. Teachers were also asked to complete the MSTQ at the end of the project.

Student. Baseline data (ITBS, classroom, self-concept, and attitude questionnaires) were collected in the fall of the first year of project implementation in a school for students in grades 6 and 7. In years 2 and 3 baseline data were collected from entering sixth grade students. During years 2 and 3, students at each site were re-assessed in the spring as they exited each participating middle school.

The recommended testing period for the ITBS sub-tests was 5½ hours. Forty minutes were required to complete the attitudinal surveys, and 30 minutes were allotted for completion of the SDQ-II. All students were tested at school during the regular school day over a week's period at both the pre- and post-testing sessions.

Qualitative

Qualitative research can be strengthened by including a variety of methods collected in a variety of ways (Patton, 1990). This study incorporated seven different qualitative data collection methods:

1. Observations of teachers and students: Extended observations using semi-structured protocols took place in classrooms throughout the study so researchers could systematically describe events and behaviors. Researchers were technically "outsiders" while in the school setting, although they fully experienced the settings under study through participation in interviews and coaching sessions. At the same time, researchers tried to understand the school setting from the perspective of "insiders" through personally experiencing classroom events, observations, and talking with other participants (Patton, 1990).

2. In-depth interviews of teachers, administrators, and students: Researchers interviewed all participating teachers and administrators formally throughout the study using semi-structured interview protocols based on evolving understandings (about differentiated instruction, differentiated authentic assessment, teacher change, middle school, gifted education, and cultural diversity and perceptions of talent) and on emergent themes (from on-going data collection and analysis). In addition, regular formal interviews were conducted with target students over time (with a conscious effort to retain targeted students within targeted teams as they matriculated through their middle school years).

3. Focus group interviews: In some sites, focus groups of 5-10 teachers and/or 3-5 students served as sources to elaborate on emergent ideas. These tape-recorded sessions occurred approximately one time per year in the sites and were transcribed for later reference.

4. Review of documents: Content analysis of lesson plans, teacher-generated assignments, and student work samples yielded supplemental insights into patterns of change over time and degree of teacher and student understanding of differentiated instruction and differentiated authentic assessment.

5. Participant narratives: Teacher reflective journals provided elaborative data and insights into teacher thought and teacher change regarding implementation of differentiated instruction and differentiated authentic assessment.

6. Videos: Periodically, videotapes of classes using differentiated instruction and differentiated authentic assessment were viewed and analyzed by researchers to gain insight into classroom practices and procedures surrounding implementation of these practices. Generally, videotaping was instigated by target or non-target teachers to capture student performances, demonstration of student products, or new attempts at unfamiliar instructional practices.

7. Researcher field journals: On-site investigators accumulated significant "informational residue," the information details collected without intent that contributed to the overall picture of the research site (Lincoln & Guba, 1990). Observers included personal, reflective comments, perceptions, ideas for future coaching sessions, and transcripts in their field journals.

Student Interviews

Interviews with students from target teachers' classrooms were structured to provide insights into students' perceptions of learning and teaching in middle school classrooms. Target students were observed in target teachers' classes. They were then interviewed individually and/or as pairs of students. Student interviews occurred approximately two to four times per year, and special attention was given to following the same students across multiple years of the study. Questions for students focused on learning preferences, specific classroom events, and the students' perceptions of school in general. Follow-up questions were frequently used to gain more information about a topic, to clarify points, or to capture a classroom scenario more completely. All interviews were tape recorded for transcription and analysis.

Teacher Observation and Interviews

Whenever possible, target teachers were interviewed directly before or after a classroom observation. Each interview lasted approximately 30-45 minutes in duration and was initiated with general questions regarding the previous or upcoming observation. A semi-structured interview protocol guided the remainder of the interview, but other emergent topics relevant to the observation, school, and/or classroom context were also investigated. Non-target teachers were occasionally observed and interviewed to establish a baseline understanding of school-wide instructional assessment practices. While the frequency of non-target teacher observations and interviews varied by site, the average occurrence was twice per year.

Teacher Coaching

Coaching target teachers (subset of target teachers) received the most intensive degree of support: individual instructional coaching followed by focused observations and interviews to determine changes in beliefs, practices, and student outcomes. Coaching sessions varied in frequency and intensity across the instructional calendar,

with the most frequent coaching during transitions in the school calendar (e.g., at the beginning of the school year, semester, and grading period). Frequency and duration of observations and interviews of target teachers fluctuated depending on the individual teacher and observer/coach schedules, but averaged approximately one to three sessions per month lasting 30-45 minutes per session.

Administrator Interviews

Administrators at each site were interviewed at least once per year to investigate school-wide issues and other influences that effected the school setting. Interviews lasted 30-45 minutes and were tape recorded for transcription and analysis.

Criteria for Trustworthiness

The naturalistic paradigm distinguishes itself from the scientific, empirical paradigm in the methods used to establish trustworthiness of inquiry. Lincoln and Guba (1990) suggest that trustworthiness can be established through credibility, transferability, dependability, and confirmability of research findings. These authors define credibility as "activities in the field that increase the probability that credible findings and interpretations will be produced" (p. 301).

Prolonged Engagement

On-site participation is an essential element in most qualitative inquiry. Extensive presence and involvement of researchers in the social setting being studied is necessary for understanding life in those settings from the perspective of those who inhabit the settings. Researchers were present at each of the research sites on a prolonged basis throughout the study, approximately 1-2 days per month over the 3-year study period. Researchers engaged in various levels of staff training, coaching, formal and informal observation, informal conversations, and formal interviewing. Multiple researchers collected data at each site and some researchers shifted sites over time, which served as a safeguard against researchers "going native." No fewer than four trained researchers collected data in each of the sites over the course of the three-year study period. While this large number of researchers in each site did present challenges for establishing interpersonal bonds with individual teachers, overall, it served to strengthen the study by providing multiple perspectives of the data and multiple approaches to coaching, observations, and interviews.

Persistent Observation

Target and non-target teachers were observed and interviewed repeatedly over time to identify and investigate specific phenomena of interest in greater depth. Further, purposeful observation scheduling allowed researchers to visit the same class periods over time in an attempt to better understand the specific classroom dynamics, individual participants, and the environment. While each target teacher was observed and interviewed at least twice per year, the smaller subset of coaching target teachers that

were selected for more in-depth investigation were observed and interviewed approximately 10 to 15 times per year for the 3-year study period. The greater attention to the smaller number of teachers in the subset allowed for the development of collegial relationships between the coach and the teacher.

Triangulation

Triangulation of data was incorporated to strengthen the study and to increase the credibility of the findings. Four major methods of triangulation were incorporated. Researchers sought data from a variety of sources. The use of multiple methods (interview, observation, document analysis) subsequently yielded a variety of types of data that were collected. For example, interview responses from students, teachers' instructional documents, and observation notes were triangulated to ascertain a more complete picture of the school and classroom scenario. This triangulation of methods was used to see data from multiple perspectives and gain additional analytic insights. Secondly, the study triangulated investigators, using multiple researchers to collect and analyze data. A conscious decision to use different researchers for data collection and data analysis allowed multiple perspectives and reduced the possibility of observer/coach bias from contaminating data analysis. Thirdly, researchers triangulated theories and sought different perspectives from varying conceptual frameworks. Further, theory and methodological triangulation (grounded theory and inductive assertions) were incorporated to include multiple perspectives and methods (Erickson, 1986; Glaser & Strauss, 1967; Patton, 1990; Strauss & Corbin, 1990).

Peer Debriefing

Researcher debriefing sessions occurred regularly throughout data collection and analysis phases of the study. University of Virginia observer/coaches met monthly to debrief and discuss trends, issues, and scenarios relevant to each research site. Remote observer/coaches corresponded informally through email and telephone conversations, sending field notes, instructional documents, photographs of student products, and other pertinent data through faxes and mail services. Researchers posed questions to observer/coaches to test preliminary theories and to shape the future direction for data collection. Researchers involved with data analysis held periodic debriefing sessions to confirm and disconfirm preliminary theories, resolve coding dilemmas, check for individual biases, and to reframe individual perspectives.

Four neutral peer debriefers met individually and collectively with data analysts to ensure that emerging findings were firmly grounded in the data and to ensure that researcher bias did not threaten the study's credibility. The four selected peer debriefers were doctoral students at the University of Virginia with a range of public school experiences. Each had training and experience with qualitative research methods; several worked for the NRC/GT on other research projects. Due to the magnitude of data collected for the study, each peer debriefer was provided with several transcripts of teacher and student interviews and/or classroom observations from varied sites. Each was asked to examine emerging teacher-change categories with regard to specific

transcripts to ensure that the categories and themes were visible in the data. Approximately three individual meetings occurred between the researcher and each peer debriefer and four group meetings occurred with several peer debriefers, in pairs or the peer debriefing team collectively.

Referential Adequacy

Observation and interview data were collected from field notes and taped (audio and/or video) sessions that were transcribed by a neutral transcriber. The transcripts were checked for accuracy and appropriate emphasis by researchers who listened to the tapes during analysis sessions. These tapes were occasionally referenced when individual researcher bias was questioned.

Data Analysis

Quantitative

ANCOVA procedures were chosen for the analytic techniques because of group score differences on the pre-assessment of the variables (ITBS scores, attitudes scores, and self-concept scores). Because of these pre-treatment differences, it stood to reason that the groups would also differ to a greater or lesser extent on the dependent variable (post ITBS scores, attitudes scores, self-concept scores regardless of treatment effect). When ANCOVA is applied, the dependent variable means are adjusted for whatever differences there are among the groups on the covariate. An adjustment is made when the mean of the group on the covariate deviates from the grand mean. Other things being equal, the larger the deviation of the group mean from the grand mean, the greater the adjustment.

The first step in addressing the quantitative research questions was to assess the overall treatment effect on each variable (teacher survey, achievement, attitudes toward specific subject areas, self-concept, and student classroom perceptions). If a significant treatment effect occurred, follow-up analyses were conducted by analyzing treatment effects within each cohort group within states.

Teacher Questionnaire Data

Many teachers who completed the MSTQ prior to the project's implementation did not complete the MSTQ at the conclusion of the project due to attrition. Hence, pre-post project comparisons were not possible. However, using a two factor between subjects design (state and treatment), a series of analyses of variance procedures (ANOVAs), controlling for Type I error, were conducted to determine if statistically significant differences existed on the teachers' responses to the pre-project survey questions between states or treatments. No statistically significant differences were found. Because there were no statistical differences in responses, teachers' responses across states and treatments were aggregated and only descriptive statistics were

computed. To avoid any misinterpretations of the data because of teacher attrition rates, only the pre-project survey are presented.

Achievement Data

For each ITBS subset, an analysis of covariance procedure was employed, with baseline scores (pre-project) serving as the covariate and the exit scores (post-project) serving as the dependent variable. Analyses were performed using SPSS™, weighting cells by their sample sizes to adjust for unequal n. For each cohort, missing values were replaced by the cohort mean for that subtest. In all cohorts, missing values ranged from 0% to 5% of the cases. Because of outlier sensitivity of the ANCOVA procedure, box plots were created for each cohort subtest. All outliers were recoded to one unit larger (or smaller) than the next most extreme score in the distribution of the cohort.

Attitude Data

For each Arlin-Hills attitudinal survey, an analysis of covariance procedure was employed, with baseline scores serving as the covariate and the exit scores serving as the dependent variable. Analyses were performed using SPSS™, weighting cells by their sample sizes to adjust for unequal n. For each cohort, missing values in each survey were replaced by the cohort mean for that survey. In all cohorts, missing values ranged from 0% to 5% of the cases. Because of outlier sensitivity of the ANCOVA procedure, box plots were created for each cohort survey. All outliers were recoded to one unit larger (or smaller) than the next most extreme score in the distribution of the cohort.

Self-concept Data

For each self-concept sub-test, an analysis of covariance procedure was employed, with baseline scores serving as the covariate and the exit scores serving as the dependent variable. Analyses were performed using SPSS™, weighting cells by their sample sizes to adjust for unequal n. For each cohort, missing values were replaced by the cohort mean. In all cohorts, missing values ranged from 0% to 5% of the cases. Because of outlier sensitivity of the ANCOVA procedure, box plots were created for each cohort sub-test. All outliers were recoded to one unit larger (or smaller) than the next most extreme score in the distribution of the cohort.

Content Surveys

Because there were no differences in student responses within cohorts or within schools, all cohorts and schools were collapsed. For each content area survey, descriptive analyses were performed item-by-item.

Qualitative

Qualitative data were analyzed using a grounded theory approach including three levels of data coding: open coding, axial coding, and selective coding with a constant

comparative method of data analysis (Glaser & Strauss, 1967; Strauss & Corbin, 1990). During open coding, the transcribed interviews, observation notes, observer/coach field notes and journal entries, and varied documents (teacher materials and student products) were read for the purpose of determining open, general categories that described, conceptualized, and categorized these data. After an initial reading of each observation and/or interview transcript for general comprehension, a more careful, second reading was conducted, during which each notable incident, idea, belief, and/or action was marked in the margins with a brief category descriptor. For example, reading a transcript from eighth grade science teacher James Winston, category descriptors such as "teacher preparation," "classroom management," "student engagement," "teacher's beliefs about learning," and "instructional strategy use" were noted in the margins of the printed page.

Following this open coding of the transcript, the researchers generated a written reflection paper about the teacher and the classroom, elaborating on the themes and patterns as they emerged. These were stored in large binders for later updating as more data accumulated. At this phase, initial data labeling and categorization were supported with identified quotes and scenarios in these written reflections. The basic unit of analysis was each individual classroom event, observation, interview, or document.

Lists of general categories were amassed across source and type of data—schools, treatment condition, and teachers—to note repetition and contradictions. Additionally, lists of unanswered questions about individual teachers, school sites, coaching episodes, and instructional practices were generated and posed to individual observer/coaches during monthly meetings (see peer debriefing). The monthly meetings were used to confirm or disconfirm trends across sites, to float initial theories, and to request specific information.

In the next phase of analysis, axial coding, the researchers configured the emerging themes, attempting to discover relationships between categories and sub-categories, seeking the context and the conditions of each category. During this phase, the researchers re-read the initial data and re-categorized and collapsed original labels into more global and refined concepts. For example, several smaller categories labeled "student engagement," "learning as entertainment," "struggling learners," "parent approval," and "administrator perception of mastery" were collapsed into the category "varied definitions of success" and then later collapsed further into "teacher identities." This new, more encompassing title was created to link events and scenarios occurring across all types of data, but all pertaining to practitioners' identities. The distinctly different types of examples in the category all included information about teachers' varied definitions of success and failure both for themselves and their students.

Using the more global concepts and the particular illustrative examples, the researchers created essays reflecting general descriptions of cause and effect paradigms and the conditions necessary to bring about changes. These essays transcended individual teachers and sets. In the case of teacher identities, for example, an essay was created to examine the ways teachers' identities (beliefs about success for themselves and their students) influenced the logical progression of changes that occurred in those who demonstrated willingness to alter their practice to address academic diversity.

In the final stage of analysis, selective coding, the researchers identified the most encompassing categories and collapsed the other themes into the most prominent concepts. A model of teacher identity and change behaviors developed at this phase that connected prominent themes from earlier phases of analysis.

CHAPTER 4: Quantitative Findings

Student Tests and Questionnaires

For each of the three student cohort groups, there were four separate areas investigated: achievement, attitudes toward school, self-concept, and perceptions of classes. Cohort 1 was those students who were assigned to teachers that participated in the project for two years. Within this cohort there were two groups: (1) those students who were assigned to participating teachers in their sixth and seventh grade years (Subset A), and (2) those students who were assigned to participating teachers in their seventh and eighth grade years (Subset B). Cohort 2 was those students who were assigned to participating teachers in their sixth, seventh, and eighth grade years. Cohort 3 was those students who were assigned to teachers in only their sixth grade year (the last year of the project). Figure 1 displays the study's design.

For each group's achievement, attitudinal, and self-concept data, baseline scores (pre-tests) served as a covariate in a one-way analysis of covariance (ANCOVA). Analyses were conducted with each group separately using SPSS™, weighting cells by their sample sizes to adjust for unequal *n*. In each of the analyses, treatment was considered a main effect; the post-achievement scores, post-attitudinal scores, and post self-concept scores were treated as the dependent variables with the pre-scores as the covariates. If a significant main effect or interaction effect was found, follow-up analyses state by state were conducted to determine where specifically significant differences existed. However, because State One had two assessment schools, if a significant main effect or interaction was found, further investigation was conducted by separating the two assessment schools to further ascertain where specific differences might have existed within the assessment treatment.

Missing values were replaced with each group's average performance, a conservative approach that does not change the mean for the distribution as a whole. In cases where the heterogeneity of regression ANCOVA assumption was violated, separate slope estimates were used. For the achievement data, results are reported using grade equivalent scores. For example, a value of 7.3 represents the seventh year third month of school (November of the seventh grade).

Because of the complexity of both the analyses and the presentation of results, only significantly different patterns are reported. Detailed information on non-significant differences can be obtained by contacting the University of Virginia National Research Center on the Gifted and Talented.

COHORT 1:

SUBSET A:	FALL—assessment as Sixth Graders (1997, 1998)	→ 2 years (Project Years 2 & 3)	SPRING—assessment as Seventh Graders
SUBSET B:	FALL—assessment as Seventh Graders (1997)	→ 2 years (Project Years 1 & 2)	SPRING—assessment as Eighth Graders (1999)

COHORT 2:

FALL—assessment as Sixth Graders	→ 3 years (Project Years 1, 2 & 3)	SPRING—assessment as Eighth Graders

COHORT 3:

FALL—assessment as Sixth Graders	→ 1 year (Project Year 3)	SPRING—assessment as Sixth Graders

Figure 1. Study design: Student cohorts.

Achievement

Cohort 1 Students

Are the achievement patterns for measures of achievement consistent across three different treatments (differentiation and assessment, assessment only, comparison) for Cohort 1 students after controlling for differences in pre-project achievement?

Subset A. Evaluation of the ANCOVA assumptions of the sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each achievement sub-test. Boxplot displays were used to detect outliers within each sub-test. Each outlier was recoded to one unit (.10 grade equivalent (GE) unit) larger (or smaller) to the next most extreme score in the sampling distribution. For each sub-test area, less than 5% of the cases were classified as outliers. Evaluation of the ANCOVA assumptions revealed violation of the homogeneity of regression assumption for the math concepts and estimation subtest. For this sub-test, separate slope estimates were used for the model. To achieve an overall experiment-wise alpha level of .05, Bonferroni's technique was employed with alpha set at .006 for each statistical test conducted.

For the areas of reading comprehension, language usage and expression, and social studies there were no statistically significant different achievement patterns found in any of the three states across any groups. Table 18 displays estimated marginal means, standard errors, and unadjusted post means for the states and sub-tests where significantly different achievement patterns were found after controlling for pre-treatment achievement differences.

After adjustment by the achievement covariate, a significant interaction between treatment and school ($F(4,173)=6.92$, $p=.001$) occurred in State One for math concepts and estimation. Further investigation of the interaction indicated that although the comparison and differentiation schools were at similar achievement levels prior to the project, by the end of the project the comparison school had made smaller gains in achievement as compared to the gains made in the differentiation school. Using eta squared (η^2) as a measure of the strength of the association between adjusted achievement scores and treatment, the relationship was weak with $\eta^2=0.08$. There were no differences between the differentiation school and the assessment schools in State One. No significantly different achievement patterns among groups were found in State Two or State Three for math concepts and estimation.

For the area of math problem-solving and data interpretation, State Three had significantly different achievement patterns after adjustment by the achievement covariate ($F(1,68)=8.07$, $p=.006$). Using estimated marginal means, the differentiation school had a larger grade-equivalent mean than did the comparison school with a mean difference of 1.2 GE units. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.18$. Neither State One nor State Two experienced any significantly different achievement patterns among groups.

Table 18

Cohort 1, Subset A—Estimated Marginal Means, Standard Errors, and Unadjusted Post Means for States With Significantly Different Achievement Patterns

Sub-test	Unadjusted Means Post (GE)	Estimated Mean (GE)	Standard Error	Sample Size
Math Concepts & Estimation				
State One				
Comparison	9.6	9.0	0.313	26
Differentiation	11.1	10.5	0.234	55
Math Problem Solving & Data Interpretation				
State Three				
Comparison	9.6	10.2	0.372	16
Differentiation	11.6	11.4	0.194	55
Science				
State One				
Comparison	11.1	10.9	0.437	26
Differentiation	12.9	11.8	0.320	55
Assessment (Marshall)	8.7	9.1	0.283	63
Maps & Diagrams				
State One				
Differentiation	12.9	11.9	0.368	55
Assessment (Marshall)	8.7	9.0	0.328	63
Assessment (Rockford)	8.4	8.7	0.495	30
Reference Materials				
State One				
Differentiation	12.9	11.0	0.309	55
Assessment (Marshall)	8.6	9.3	0.286	63
Assessment (Rockford)	7.4	7.8	0.411	30
State Three				
Comparison	9.6	9.5	0.536	16
Differentiation	11.6	11.6	0.286	55

After adjustment for pre-treatment achievement differences in the area of science, State One had significantly different achievement patterns among treatment conditions ($F(3,173)=18.29$, $p=.000$). Using estimated marginal means, differences in achievement patterns were noted between the comparison school and one assessment school (Marshall) and the differentiation school and that same assessment school, with the assessment school having the lower grade-equivalency mean in both cases, 1.8 GE units and 2.7 GE units respectively. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.18$. States Two or Three did not reveal any significantly different achievement patterns among treatment groups.

For the area of maps and diagrams, significantly different achievement patterns were found between the differentiation school and both assessment schools in State One after adjusting for pre-treatment achievement differences ($F(3,173)=13.43$, $p=.000$). In particular, the differentiation school had the larger grade-equivalent mean in both cases,

3.2 GE units higher than Rockford and 2.9 GE units higher than Marshall. The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.19. States Two or Three did not reveal any significantly different achievement patterns among treatment groups.

For the area of reference materials, significantly different achievement patterns were found in State One among treatment groups after adjusting for pre-treatment achievement differences (F(3,170)=13.89, p=.000; η^2=0.14). Using estimated marginal means, the differentiation school had a larger grade-equivalency mean than either of the assessment schools, 3.2 GE units larger than Rockford and 1.7 GE units larger than Marshall. The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.19. State Three also experienced significantly different achievement patterns among the differentiation and comparison schools (F(1,70)=11.08, p=.001; η^2=0.14). Using estimated marginal means, the differentiation school had a larger grade-equivalent mean by 2.1 GE units. The strength of the association between adjusted achievement scores and treatment was weak however with η^2=0.19. State Two did not have significantly different achievement patterns across treatment groups.

In general, the differentiation schools showed greater gains in achievement than did the other schools after controlling for pre-treatment achievement differences. However, one assessment school's patterns of achievement were not significantly different from the differentiation or the comparison schools' achievement patterns. Even though differences were found, attention should be given to the value of eta squared in each case. Eta squared is an indication of the amount of variance in the adjusted dependent variable that is accounted for by the treatment. In the results reported above, eta squared ranged from a low of 8% in the area of math concepts and estimation to a high of 19% in the area of maps and diagrams. These values suggest that factors other than the ones that were being investigated played a large role in the differences found in achievement patterns. In other words, the treatment had little effect on the achievement gains that were found in any of the achievement areas.

Subset B. Results of the ANCOVA assumptions indicated there were no violations for any subtest area across any of the states. For the areas of reading comprehension, math concepts and estimation, math problem solving and data interpretation, or science no differences in achievement patterns occurred within any of the three states after adjustment of pre-treatment achievement differences were made. Table 19 displays marginal means and standard errors for the sub-test areas that had significantly different achievement patterns after adjusting for pre-treatment achievement differences.

Table 19

Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns

Sub-test	Unadjusted Post Means (GE)	Estimated Mean (GE)	Standard Error	Sample Size
Language Usage & Expression				
State One				
Differentiation	12.4	11.4	0.288	74
Assessment (Rockford)	8.0	8.9	0.461	27
Social Studies				
State Two				
Differentiation	8.0	7.1	0.038	46
Assessment	6.5	6.9	0.034	57
Maps & Diagrams				
State Two				
Differentiation	11.0	10.2	0.429	46
Assessment	7.7	8.1	0.379	57
Reference Materials				
State One				
Differentiation	11.7	10.8	0.296	74
Assessment (Rockford)	7.9	8.8	0.473	27

For the area of language usage and expression, State One had significantly different achievement patterns among treatment groups after adjustment of pre-treatment achievement differences was made ($F(3,184)=7.17$, $p=.000$). Using estimated marginal means, different achievement patterns were observed between the differentiation school and one of the assessment schools (Rockford), with the differentiation school having the higher grade-equivalent mean (mean difference of 2.5 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.08$. States Two and Three did not have significantly different achievement patterns among treatment groups.

In the area of social studies after adjusting for pre-treatment achievement differences, State Two had significantly different achievement patterns among treatment groups ($F(2,152)=5.27$, $p=.006$). Using estimated marginal means, different achievement patterns were observed between the differentiation and the assessment schools, with the differentiation school having the larger grade-equivalent mean (mean difference of 0.2 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.07$. There were no significantly different achievement patterns among treatment groups in State One or State Three.

After adjustment of pre-treatment achievement differences were made in the area of maps and diagrams, State Two had significantly different achievement patterns among treatment groups ($F(2,152)=7.08$, $p=.001$). Using estimated marginal means, different achievement patterns were observed between the differentiation school and the

assessment school, with the differentiation school having the higher grade-equivalent score (mean difference of 2.1 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.09. There were no significantly different achievement patterns among treatment groups in State One or State Three.

For the area of reference materials, State One had significantly different achievement patterns among treatment groups after adjusting for pre-treatment achievement differences (F(3,180)=4.64, p=.004). Using estimated marginal means, different achievement patterns were observed between the differentiation school and one of the assessment schools (Rockford), with the differentiation school having the higher grade-equivalent score (mean difference of 2.0 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.07.

In general, across all states where significantly different achievement patterns were found, the differentiation schools had greater achievement gains than the assessment schools, with no differences found between the differentiation schools and the comparison schools. Eta squared ranged from 7% in social studies to 9% in maps and diagrams, which suggests that very little of the variance in the adjusted dependent variables (DV) was accounted for by treatment. These values suggest that factors other than the ones that were being investigated played a large role in the differences in achievement patterns. In other words, the treatment had very little impact on the achievement gains that were found in any of the achievement areas.

Cohort 2 Students

Are the achievement patterns for measures of student achievement consistent across three different treatments for Cohort 2 after adjusting for initial achievement differences prior to the treatments?

Boxplot displays revealed outliers within each sub-test. Each outlier was recoded to one unit (.10 GE unit) larger (or smaller) to the next most extreme score in the sampling distribution. In each sub-test area, less than 5% of the cases were classified as outliers. To achieve an overall experiment-wise alpha level of .05, a Bonferroni technique was employed with alpha set at .006 for each statistical test conducted.

Results indicated no significantly different achievement patterns in any state for the areas of language usage and expression, math concepts and estimation, science, maps and diagrams, or reference materials. Table 20 displays estimated marginal means and standard errors for sub-tests where significantly different achievement patterns were found.

Table 20

Cohort 2—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns

Sub-Test	Unadjusted Means Post (GE)	Estimated Mean (GE)	Standard Error	Sample Size
Reading Comprehension				
State Two				
Differentiation	9.6	9.5	0.368	44
Comparison	7.4	7.3	0.425	33
Assessment	7.3	7.4	0.346	50
Problem Solving & Data Interpretation				
State One				
Differentiation	11.8	11.3	0.266	77
Assessment (Rockford)	7.7	8.7	0.324	59
Social Studies				
State One				
Differentiation	12.3	11.5	0.285	77
Assessment (Rockford)	8.6	9.7	0.338	59
State Two				
Differentiation	10.2	10.0	0.421	44
Assessment	7.9	8.0	0.394	50

In the area of reading comprehension, when treatment effects were investigated, State Two had significantly different achievement patterns across treatment groups after adjusting for initial differences ($F(2,126)=10.17$, $p=.000$). Using estimated marginal means, differences in achievement patterns existed between the differentiation school and the comparison school, and the differentiation school and the assessment school, with the differentiation school having a larger grade-equivalent mean in both cases (mean difference of 2.2 and 2.1 respectively). The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.14$. No differences in achievement patterns across treatment conditions were found in State One.

For math problem solving and data interpretation, results indicated different achievement patterns across treatment conditions in State One after controlling for differences prior to the treatments. Thirteen percent of the variance in the adjusted DV was associated with treatment ($F(3,158)=11.43$, $p=.000$). Post hoc analyses revealed differences in achievement patterns between the differentiation school and one of the assessment schools (Rockford), with the differentiation school having the higher GE score (2.6 GE units). However, all treatment conditions had mean GE scores at or above grade level. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.13$. No differences were found in achievement patterns across treatment conditions in State Two.

For social studies, analyses indicated that in State One, statistically different achievement patterns occurred across treatment conditions after controlling for initial

differences, with 10% of the variance in the adjusted DV associated with treatment ($F(3,158)=8.56$, $p=.000$). Differences in achievement patterns were found between one of the assessment schools (Rockford) and the differentiation school. Using estimated marginal means, the mean difference was 1.8 GE units, with the differentiation school having the larger grade-equivalency mean. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.10$. It should be noted that all schools within State One were performing at or above grade level. For State Two, different achievement patterns were also found across treatment conditions in the area of social studies after adjusting for initial differences, with 10% of the DV associated with treatment ($F(2,126)=6.79$, $p=.002$). Further analyses indicated differences in achievement patterns between the differentiation school and the assessment school, with the differentiation school having the larger grade-equivalent mean (mean difference of 2.0 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.10$.

Cohort 3 Students

Achievement

Are the patterns for measures of student achievement consistent across three different treatments for Cohort 3 after adjusting for initial achievement differences prior to the treatments?

Boxplot displays revealed outliers within each sub-test. Each outlier was recoded to one unit (.10 GE unit) larger (or smaller) to the next most extreme score in the sampling distribution. In each sub-test area, there were less than 5% of the cases classified as outliers. To achieve an overall experiment-wise alpha level of .05, a Bonferroni technique was employed with alpha set at .006 for each statistical test conducted.

Evaluation of the assumptions of sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each achievement sub-test. All assumptions were met for each sub-test with the exception of the science sub-test for State Two. For this model, separate slope estimates were used.

No differences in achievement patterns were found for the areas of language usage and expression, math concepts and estimation, or social studies in any of the three states. Table 21 displays estimated marginal means and standard errors for sub-test areas within states that experienced significantly different achievement patterns.

Table 21

Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Achievement Patterns

Sub-Test	Unadjusted Post Means (GE)	Estimated Mean (GE)	Standard Error	Sample Size
Reading Comprehension				
State One				
Differentiation	9.3	9.6	0.174	137
Assessment (Marshall)	8.4	8.4	0.161	161
Problem Solving & Data Interpretation				
State Two				
Comparison	6.6	6.8	0.175	133
Differentiation	8.3	8.1	0.152	180
Assessment	7.7	7.8	0.169	143
Science				
State One				
Differentiation	10.0	9.8	0.179	137
Assessment (Marshall)	8.9	9.0	0.165	161
Maps & Diagrams				
State Two				
Comparison	7.4	7.4	0.215	133
Differentiation	8.5	8.3	0.186	180
Reference Materials				
State One				
Differentiation	9.8	9.7	0.174	137
Assessment (Marshall)	8.4	8.4	0.146	161
Assessment (Rockford)	7.4	7.8	0.354	33

For the area of reading comprehension after controlling for initial achievement differences, different achievement patterns were found in State One ($F(3,350)=8.31$, $p=.000$), with 6% of the variance in the adjusted DV associated with treatment. Differences in achievement patterns were found between the differentiation school and one of the assessment schools (Marshall), with the differentiation school having a larger grade-equivalent mean (mean difference of 1.2 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.06$. No differences in achievement patterns were found in State Two or State Three.

For math problem solving and data interpretation, only State Two experienced significantly different achievement patterns across treatment groups after controlling for initial achievement differences ($F(2,455)=17.03$, $p=.000$). Differences in achievement patterns were found between the comparison school and the differentiation school and between the differentiation school and the assessment school, with the differentiation school having the larger grade-equivalent mean in both cases (mean difference of 1.3 GE units and 1.0 GE units, respectively). The comparison school achievement pattern was also significantly different from the assessment school, with the assessment school having the larger grade-equivalent mean score. The strength of the association between

adjusted achievement scores and treatment was weak, however, with η^2=0.07. Differences in achievement patterns were not found in State One or State Three.

For the area of science after controlling for initial differences, a significant interaction effect between treatment and achievement was found in State One (F(3,354)=115.87; p=.000). Further investigation of the interaction through plots indicated that although the differentiation school and one of the assessment schools (Marshall) were at similar achievement levels prior to the project, by the end of the project, the differentiation school had made slightly larger gains in achievement when compared to the gains made in Marshall. The strength of the association between the adjusted achievement scores and treatment was moderately large with η^2=0.57. Achievement pattern differences were not found in State Two or State Three (see Figure 2).

In the area of maps and diagrams, State Two had significantly different achievement patterns across treatment groups after controlling for any initial achievement differences (F(2,455)=6.16, p=.02). Analyses indicated that differences existed between the comparison and the differentiation schools, with the differentiation school having the larger grade-equivalent mean (mean difference of 0.9 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.02.

In the area of reference materials, after controlling for initial achievement differences, State One had significantly different response patterns (F(3,354)=14.17, p=.000), with 10% of the variance in the adjusted DV associated with treatment. Follow-up analyses indicate that the differentiation school and both of the assessment schools had significantly different achievement patterns, with the differentiation school having larger grade-equivalent means than the assessment schools (mean differences of 1.9 and 1.3 GE units). The strength of the association between adjusted achievement scores and treatment was weak, however, with η^2=0.10.

Achievement Subtest	State One	State Two	State Three
Reading Comprehension	Differentiation > Assessment (Marshall) (Cohort 3)	Differentiation > Comparison (Cohort 2) Differentiation > Assessment (Cohort 2)	
Language Usage and Expression	Differentiation > Assessment (Rockford) (Cohort 1 – Subset B)		
Social Studies	Differentiation > Assessment (Rockford) (Cohort 2)	Differentiation > Assessment (Cohort 1 – Subset B) Differentiation > Assessment (Cohort 2)	
Math Concepts and Estimation	Differentiation > Comparison (Cohort 1 – Subset A)		
Math Problem Solving and Data Interpretation	Differentiation > Assessment (Rockford) (Cohort 2)	Differentiation > Comparison (Cohort 3) Differentiation > Assessment (Cohort 3) Assessment > Comparison (Cohort 3)	Differentiation > Comparison (Cohort 1 – Subset A)
Maps and Diagrams	Differentiation > Assessment (Rockford) (Cohort 1 – Subset A) Differentiation > Assessment (Marshall) (Cohort 1 – Subset A)	Differentiation > Assessment (Cohort 1 – Subset B) Differentiation > Comparison (Cohort 3)	

Figure 2. Summary of significant differences across states and achievement tests.

Achievement Subtest	State One	State Two	State Three
Reference Materials	Differentiation > Assessment (Rockford) (Cohort 1 – Subset B) Differentiation > Assessment 2 (Rockford) (Cohort 1 – Subset A) Differentiation > Assessment 1 (Marshall) (Cohort 1 – Subset A) Differentiation > Assessment (Cohort 3)		Differentiation > Comparison (Cohort 1 – Subset A)
Science	Differentiation > Assessment (Marshall) (Cohort 3) Differentiation > Assessment (Cohort 1 – Subset A) Comparison > Assessment (Marshall) (Cohort 1 – Subset A)		

Figure 2. Summary of significant differences across states and achievement tests. (continued)

Attitudes Toward School

Cohort 1 Students

All results are reported in raw scores. Each attitude scale had a raw score range from 0 to 45. To achieve an overall experiment-wise alpha level of .05, Bonferroni's technique was employed with alpha set at .0125 for each statistical test conducted.

Are the response patterns for measures of attitude towards school (language arts, mathematics, learning processes, teachers) consistent across three different treatments for Cohort 1 after controlling for differences in attitudes prior to the treatments?

Evaluation of the ANCOVA assumptions of sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each attitudinal questionnaire. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. In each case, less than 5% of the cases were classified as outliers.

Subset A. None of the ANCOVA assumptions were violated with any of the questionnaires with the exception of the homogeneity of regression assumption in the area of attitude towards learning processes in State Two. For this questionnaire, separate slope estimates were used for the model.

Results indicated that there were no differences in response patterns in the areas of attitudes toward language arts, learning processes, or teachers in any state among treatment groups after controlling for attitudinal differences prior to the project. Table 22 displays the estimated marginal means and standard errors for states where differences in response patterns were found.

Table 22

Cohort 1, Subset A—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Attitude Area	Unadjusted Post Means (GE)	Estimated Mean (GE)	Standard Error	Sample Size
Mathematics				
State Two				
Comparison	21.74	21.62	1.06	42
Differentiation	26.64	26.91	1.30	28

After adjusting for pre-treatment attitudinal differences in attitudes toward mathematics, State Two was the only state to have significantly different response patterns across treatment groups ($F(2,130)=6.02$, $p=.003$), with 9% of the variance in the adjusted DV accounted for by treatment. Using estimated marginal means, differences in response patterns were found between the comparison school and the differentiation school, with the differentiation school reporting more positive attitudes toward mathematics than the comparison school. There were no differences found in response patterns in State One or State Three for the area of attitudes toward math.

Subset B. All ANCOVA assumptions were met for each questionnaire. Table 23 displays estimated marginal means and standard errors for the attitudinal areas where significantly different response patterns were found after controlling for pre-treatment attitudinal differences. In State One, significantly different response patterns were found in attitudes toward language arts, attitudes toward learning processes, and attitudes toward teachers. Significant differences were also found in State Two in the area of attitudes toward language arts, with both the assessment and differentiation schools having more positive attitudes than the comparison school. No attitudinal differences were found in State Three.

Table 23

Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Attitude Area	Unadjusted Post Means	Estimated Mean	Standard Error	Sample Size
Language Arts				
State One				
Comparison	18.14	18.04	0.841	21
Differentiation	19.08	18.92	0.455	74
Assessment (Marshall)	23.51	23.78	0.505	63
State Two				
Comparison	17.06	17.04	0.384	50
Differentiation	18.93	18.91	0.400	46
Assessment	18.65	18.69	0.364	57
Learning Processes				
State One				
Comparison	20.48	20.37	1.158	21
Differentiation	18.81	18.94	0.609	74
Assessment (Marshall)	12.41	12.43	0.658	63
Teachers				
State One				
Comparison	19.24	19.16	0.942	21
Differentiation	22.76	22.54	0.546	74

For attitudes toward language arts, 31% of the variance in the adjusted DV was associated with the treatment ($F(3,184)=26.97$, $p=.000$) in State One. Differences were found between the comparison school and one of the assessment schools (Marshall) as well as Marshall and the differentiation school, with Marshall in both cases reporting more positive attitudes. In State Two, differences in response patterns were found ($F(2,152)=7.07$, $p=.001$) between the comparison school and the differentiation school as well as the comparison school and the assessment school, with the comparison school in both cases reporting less positive attitudes toward language arts. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.09$.

After adjusting for pre-treatment attitudinal differences, in the area of attitudes toward learning processes, State One had significantly different response patterns ($F(3,184)=12.12$, $p=.001$). Specific response pattern differences occurred between one of the assessment schools (Marshall) and both the comparison school and the differentiation school, with the assessment school reporting less positive attitudes toward learning processes than the other two schools. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.12$.

After adjusting for pre-treatment attitudinal differences in the area of attitudes toward teachers, significantly different response patterns were found in State One among groups ($F(3,184)=5.62$, $p=.004$). Response patterns differences occurred between the comparison school and the differentiation school, with the differentiation school reporting more positive attitudes toward teachers than the comparison school. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.06$.

Cohort 2 Students

Are the response patterns for measures of attitude toward school (language arts, mathematics, learning processes, teachers) consistent across three different treatments for Cohort 2 after controlling for initial differences in attitudes?

Evaluation of the ANCOVA assumptions of the sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were conducted for each attitudinal questionnaire with no violations occurring in any of the three states. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. In each area, less than 5% of the cases were classified as outliers.

No differences were found in any state for attitudes toward teachers. However, differences in response patterns were noted in State One for attitudes toward learning processes and in State Two for attitudes toward language arts and attitudes toward learning processes. Table 24 displays the estimated marginal means and standard errors for states where differences in response patterns were found.

Table 24

Cohort 2—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Attitude Area	Unadjusted Post Means	Estimated Mean	Standard Error	Sample Size
Language Arts				
State Two				
Differentiation	19.05	19.29	1.018	44
Assessment	23.58	23.80	0.955	50
Learning Processes				
State One				
Comparison	15.86	16.57	1.210	14
Differentiation	24.00	23.68	0.517	77
Assessment (Rockford)	10.89	14.30	0.588	59
Assessment (Marshall)	13.97	10.30	1.486	9
State Two				
Comparison	17.39	17.84	1.324	33
Differentiation	12.20	11.78	1.121	44
Assessment	17.78	17.78	0.973	50

For attitudes toward language arts, State Two had significantly different response patterns across treatment groups after controlling for initial differences ($F(2,126)=6.42$, $p=.002$). Response pattern differences were found between the differentiation school and the assessment school, with the differentiation school reporting less positive attitudes than the assessment school. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.09$. No differences were found in State One or State Three across any of the groups.

For attitudes toward learning processes, State One had significantly different response patterns across treatment groups after controlling for initial differences ($F(3,158)=60.44$, $p=.000$). Differences in response patterns were noted between the comparison school and both the differentiation school and one of the assessment schools (Marshall), and between the differentiation school and both the assessment schools. In all cases, the differentiation school reported more positive attitudes toward learning processes than any of the other schools. The strength of the association between adjusted achievement scores and treatment was moderately large with $\eta^2=0.54$. However, the small sample sizes should be noted in the comparison school and Marshall. In State Two, significantly different response patterns occurred across groups after initial differences were taken into account ($F(2,126)=8.68$, $p=.000$). Response pattern differences were found between the differentiation school and both the comparison and the assessment schools, with the differentiation school reporting less positive attitudes toward learning processes than either of the other two schools. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.12$. Significantly different response patterns were also found in State Three with the differentiation.

Cohort 3 Students

Are the response patterns for measures of attitude toward school (language arts, mathematics, learning processes, teachers) consistent across three different treatments for Cohort 2 after controlling for initial differences in attitudes?

Evaluation of the ANCOVA assumptions of the sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each attitudinal questionnaire. Violations of the homogeneity of regression assumption occurred in State One for attitudes toward language arts. For this model, separate slope estimates were used. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. In each attitudinal area, less than 5% of the cases were classified as outliers.

Only in State Three were no differences in response patterns for any of the attitudinal questionnaires found. In State One, response pattern differences were found in attitudes toward language arts, learning processes, and teachers. In State Two, response pattern differences were found in attitudes toward mathematics, learning processes, and teachers. Table 25 displays the estimated marginal means and standard errors for those states where differences in response patterns were found.

For attitudes toward language arts, after controlling for initial attitudinal differences, State One had a significant interaction effect between treatment and attitudes ($F(3,354)=24.08$, $p=.000$). Further investigation of the interaction effect indicated that even though schools held similar attitudes toward language arts prior to the project, one of the assessment schools (Marshall) did not have similar gains in attitudes as the differentiation schools, with the assessment school (Marshall) having less positive attitudes. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.17$.

For attitudes toward mathematics, after controlling for initial attitudinal differences, State Two had significantly different response patterns among groups ($F(2,455)=6.20$, $p=.002$). Differences were found between the assessment school and both the comparison and differentiation schools, with the assessment school reporting more positive attitudes toward mathematics than either of the other two schools, even though the differences were slight. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.03$.

For attitudes toward learning processes, State One had differences in response patterns among groups after controlling for initial differences ($F(3,354)=10.06$, $p=.000$). Further investigation revealed response pattern differences between the differentiation school and the comparison school, with the differentiation school reporting more positive attitudes towards learning processes than the comparison school. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.05$. In State Two, differences in response patterns were found among the

assessment school and the comparison school ($F(2,455)=6.37$, $p=.002$), with the assessment school reporting the more positive attitudes toward learning processes than the comparison school, although the differences were small. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.03$. No differences were found in State Three.

Table 25

Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Attitude Area	Unadjusted Post Means	Estimated Mean	Standard Error	Sample Size
Language Arts				
State One				
Differentiation	28.17	27.64	0.635	137
Assessment (Marshall)	25.16	23.36	0.547	161
Mathematics				
State Two				
Comparison	23.58	23.58	0.317	133
Differentiation	23.67	23.67	0.272	180
Assessment	24.94	24.94	0.307	143
Learning Processes				
State One				
Comparison	15.29	14.25	1.579	24
Differentiation	20.11	19.70	0.661	137
State Two				
Comparison	16.54	18.77	0.550	180
Assessment	19.83	19.66	0.619	143
Teachers				
State One				
Differentiation	28.66	30.11	0.574	137
Assessment (Marshall)	26.19	24.42	0.545	161
State Two				
Comparison	24.53	24.60	0.539	133
Differentiation	27.29	27.19	0.461	180

For attitudes toward teachers, after controlling for initial differences in attitudes, differences in response patterns were found in State One between the differentiation school and one of the assessment schools (Marshall) ($F(3,354)=14.46$, $p=.000$), with the differentiation school having more positive attitudes. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.08$. In State Two, differences in response patterns were found between the differentiation school and the comparison school ($F(2,455)=7.03$, $p=.001$). Results indicated that the differentiation school had more positive attitudes than the comparison school. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.03$. No differences were found in State Three (see Figure 3).

	State One	State Two	State Three
Attitudes Toward Language Arts	Assessment (Marshall) > Differentiation (Cohort 1 – Subset B) Assessment (Marshall) > Comparison (Cohort 1 – Subset B) Differentiation > Comparison (Cohort 1 – Subset B) Differentiation > Assessment (Marshall) (Cohort 3)	Differentiation > Comparison (Cohort 1 – Subset B) Assessment > Comparison (Cohort 1 – Subset B) Assessment > Differentiation (Cohort 2)	
Attitudes Toward Math		Differentiation > Comparison (Cohort 1 – Subset A) Assessment > Comparison (Cohort 3) Assessment > Differentiation (Cohort 3)	
Attitudes Toward Learning Processes	Comparison > Assessment (Marshall) (Cohort 1 – Subset B) Differentiation > Assessment (Marshall) (Cohort 1 – Subset B) Differentiation > Comparison (Cohort 2) Differentiation > Assessment (Rockford) (Cohort 2) Differentiation > Assessment (Marshall) (Cohort 2) Comparison > Assessment (Marshall) (Cohort 2) Differentiation > Comparison (Cohort 3)	Assessment > Differentiation (Cohort 2) Comparison > Differentiation (Cohort 2) Assessment > Comparison (Cohort 3)	
Attitudes Toward Teachers	Differentiation > Comparison (Cohort 1 – Subset B) Differentiation > Assessment (Marshall) (Cohort 3)	Differentiation > Comparison (Cohort 3)	

Figure 3. Summary of significant differences across states and attitude assessments.

Self-concept

Cohort 1 Students

All results are reported in raw scores. The raw score range for each scale is 10 to 60. To achieve an overall experiment-wise alpha level of .05, Bonferroni's technique was employed with alpha set at .018 for each statistical test conducted.

Are the response patterns for measures of self-concept (math, verbal, school) consistent across three different treatments for Cohort 1 after adjusting for self-concept differences prior to project implementation?

Evaluation of the ANCOVA assumptions of sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were conducted for each self-concept questionnaire. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. In each area, less than 5% of the cases were classified as outliers.

Subset A. Results indicated that there were no statistically different response patterns for any questionnaire across any of the three states after controlling for initial differences in self-concepts.

Subset B. All ANCOVA assumptions were met for each self-concept questionnaire. Results indicated that there were statistically different response patterns in all three states after taking into account self-concept differences prior to the project implementation. In State One, different response patterns occurred in the areas of math, verbal, and school self-concept; in State Two, significantly different response patterns occurred only in the area of verbal self-concept; in State Three, math was the only area that had significantly different response patterns. Table 26 displays estimated marginal means and standard errors for the self-concept areas where significantly different response patterns were found.

In the area of mathematics self-concept, significantly different response patterns occurred in State One and in State Three. In State One, 6% of the variance in the adjusted DV was associated with treatment ($F(3,184)=6.16$, $p=.003$) after adjusting for initial differences in self-concepts. Results indicated that one of the assessment schools (Marshall) reported higher math self-concepts than either the differentiation school or the comparison school using estimated marginal means. In State Three, differences in response patterns also occurred ($F(1,72)=8.86$, $p=.004$) with the differentiation school reporting higher math self-concepts than the comparison school when using estimated marginal means. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.11$.

Table 26

Cohort 1, Subset B—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Self-Concept Area	Unadjusted Post Means	Estimated Mean	Standard Error	Sample Size
Mathematics				
State One				
Comparison	29.90	28.87	1.754	21
Differentiation	34.35	34.37	0.931	74
Assessment (Marshall)	38.73	38.70	1.025	63
State Three				
Comparison	30.96	30.73	1.117	26
Differentiation	34.74	34.88	0.829	47
Verbal				
State One				
Comparison	33.10	33.10	1.398	21
Differentiation	33.91	33.74	0.800	74
Assessment (Marshall)	41.32	41.48	0.857	63
State Two				
Comparison	33.44	33.57	0.554	50
Differentiation	30.26	30.29	0.567	46
Assessment	30.51	30.38	0.521	57
School				
State One				
Comparison	32.52	32.79	1.470	21
Differentiation	35.62	36.28	0.802	74
Assessment (Marshall)	44.49	40.74	0.728	63

In the area of verbal self-concept, both State One and State Two had significantly different response patterns across treatment groups after controlling for differences in self-concepts prior to project implementation. In State One, 12% of the variance in the adjusted DV was associated with treatment ($F(3,184)=12.14$, $p=.000$), with one of the assessment schools (Marshall) reporting a higher verbal self-concept than either the differentiation school or the comparison school. In State Two, 13% of the variance in the adjusted DV was associated with treatment ($F(2,152)=11.30$, $p=.000$), with the comparison school reporting higher verbal self-concepts than either the differentiation school or the assessment school.

For the area of school self-concept, State One was the only state to have significantly different response patterns across treatment groups after controlling for initial differences ($F(3,184=15.06$, $p=.000$). Follow-up analysis indicated that one of the assessment schools (Marshall) reported a higher school self-concept than either the differentiation or the comparison schools. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.11$.

Cohort 2 Students

Are the response patterns for measures of self-concept (math, verbal, school) consistent across three different treatments for Cohort 2 after controlling for initial self-concept differences?

Evaluation of the assumptions of the sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each self-concept questionnaire. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. For each self-concept area, less than 5% of the cases were classified as outliers. Evaluation of the ANCOVA assumptions indicated no violations for any area within any state.

After controlling for initial differences in self-concept, there were no significantly different response patterns for any of the self-concept areas.

Cohort 3 Students

Are the response patterns for measures of self-concept (math, verbal, school) consistent across three different treatments for Cohort 3 after controlling for initial self-concept differences?

Evaluation of the assumptions of the sampling distribution, linearity, homogeneity of variance, homogeneity of regression, and reliability of covariates were performed for each self-concept questionnaire. Boxplot displays revealed outliers within each questionnaire. Each outlier was recoded to one unit larger (or smaller) to the next most extreme score in the sampling distribution. For each self-concept area, less than 5% of the cases were classified as outliers. Table 27 displays estimated marginal means and standard errors for states and self-concept areas where differences were found after controlling for initial differences in self-concepts.

In the area of math self-concept, after controlling for initial self-concept differences, a significant interaction effect was found in State One among treatment groups. Investigation of the interaction effect through profile plots indicate that while schools held similar self-concepts prior to the project, by the end of the project, the differentiation school and the comparison schools had significant declines in their self-concepts when compared to the assessment school.

In the area of verbal self-concept, after controlling for initial self-concept differences, significantly different response patterns were found in State One among treatment groups ($F(3,354)=10.49$, $p=.000$). Follow-up analyses within schools indicate response pattern differences between the differentiation school and one of the assessment schools (Marshall), with the differentiation school reporting the more positive self-concepts. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.06$. In State Two, a significant interaction

effect was found between treatment and verbal self-concept ($F(3,455)=7.66$, $p=.001$). Investigation of profile plots indicates that departure from parallelism occurred in response patterns due to larger gains in self-concept scores by the differentiation school than the other two schools. The strength of the association between adjusted achievement scores and treatment was weak, however, with $\eta^2=0.03$ (see Figure 4).

Table 27

Cohort 3—Estimated Marginal Means and Standard Errors for States With Significantly Different Response Patterns

Self-Concept Area	Unadjusted Post Means	Estimated Mean	Standard Error	Sample Size
Mathematics				
State One				
Comparison	40.38	40.20	0.597	133
Differentiation	40.02	40.08	0.513	180
Assessment	42.13	42.15	0.575	143
Verbal				
State One				
Differentiation	47.35	47.44	0.628	137
Assessment (Marshall)	43.26	43.68	0.580	161
State Two				
Comparison	43.27	43.91	0.486	133
Differentiation	46.59	45.52	0.430	180
Assessment	43.82	43.97	0.464	143

	State One	State Two	State Three
Math	Assessment > Comparison (Marshall) (Cohort 1 – Subset B) Assessment > Differentiation (Marshall) (Cohort 1 – Subset B) Assessment > Differentiation (Cohort 3) Assessment > Comparison (Cohort 3)		Differentiation > Comparison (Cohort 1 – Subset B)
Verbal	Assessment (Marshall) > Differentiation (Cohort 1 – Subset B) Assessment (Marshall) > Comparison (Cohort 1 – Subset B) Differentiation > Assessment (Marshall) (Cohort 3)	Comparison > Differentiation (Cohort 1 – Subset B) Comparison > Assessment (Cohort 1 – Subset B) Differentiation > Comparison (Cohort 3) Differentiation > Assessment (Cohort 3)	
School	Assessment (Marshall) > Differentiation (Cohort 1 – Subset B) Assessment (Marshall) > Comparison (Cohort 1 – Subset B)		

Figure 4. Summary of significant differences in self-concept across states.

Teacher Questions

- To what degree do middle school classrooms appear to engage in developmentally appropriate structures and practices likely to address the wide range of academic readiness, interests, and learning profiles inevitable in middle level populations?
- What is the nature of the curriculum and instruction at the middle level and to what degree does it seem appropriately responsive to academic diversity?
- How do middle level teachers enact the concept of differentiating or modifying curriculum and instruction based on learner readiness, interest, and learning profile?

Middle School Teacher Results

Results for the teachers' responses are grouped and presented in the following categories: teachers' responses to pre-assessment are presented first, followed by teachers' responses to content decisions and delivery of content, assessment of student achievement, grading, and other issues related to academic concerns.

Pre-assessment Practices

Teachers were asked how often they used certain strategies to pre-assess students (Table 28). The majority of teachers indicated using observation of student responses and discussion and example activities at least weekly for pre-assessing students' knowledge, understandings, and skills. Previous year's grades, state testing results, and portfolios were strategies that the majority of teachers reported using once a year or less as pre-assessment techniques. Only 10% of teachers reported using formal pre-tests once a week or more.

Use of Pre-assessment Data

The majority of teachers reported using pre-assessment data to modify the content of activities given to students, the type of product required of students, the type of activities given to students, the scheduling of student activities, and student work group arrangements at least monthly (Table 29). Less than 15% of teachers reported daily use of pre-assessment data to modify instruction and only about one-third used data once a week or more to modify instruction.

Table 28

Use of Pre-assessment Methods

How often do you use the following strategies to pre-assess students?	Never	Once per year	2x per year	1 or 2x per month	1 or 2x per week	Every day	Mean* (Std Dev)
Pre-test	12	12	25	42	9	1	3.27 (1.21)
Example activities	9	2	8	25	33	23	4.36 (1.48)
Individual conferences	20	10	14	37	13	6	3.26 (1.54)
Portfolios	54	9	12	13	7	5	2.24 (1.60)
Results from last year's state mandated tests	26	34	21	12	6	2	2.43 (1.29)
Students' grades from the previous year	42	35	15	6	2	1	1.92 (1.06)
Observation of student performance on project or product	4	6	8	34	27	21	4.32 (1.34)
Observation of student responses and discussion	5	1	3	17	27	48	4.99 (1.35)
Journal writing	31	4	4	24	28	10	3.44 (1.85)

* Scale Range = 1 (Never) to 6 (Everyday)

Table 29

Use of Pre-assessment Information

How often do you use pre-assessment data to modify:	Never	Once per year	2x per year	1 or 2x per month	1 or 2x per week	Every day	Mean* (Std Dev)
Content of learners' activities?	10	4	13	43	21	10	3.88 (1.36)
Type of product required of a student?	16	8	14	36	15	11	3.59 (1.55)
Type of activity you choose for a student?	13	5	13	33	25	11	3.81 (1.51)
Scheduling of student activities?	19	5	14	28	20	14	3.62 (1.67)
Student work group arrangements?	12	2	11	43	20	13	3.92 (1.45)

*Scale Range = 1 (Never) to 6 (Every day)

Instructional Practices

Factors in Determining Content to Be Taught

Teachers were asked the importance of certain factors in determining the content they taught and to rank the importance of each (Table 30). The majority of teachers rated the general skill level of their students to be extremely important in determining content taught. Forty-seven percent of teachers also reported local standards and curriculum guides, state or national curriculum standards, and general readiness level of students as extremely important. A large percentage of teachers considered textbooks, knowledge gained from pre-assessment, teacher-selected themes, student questions/interests, key concepts, and the general readiness level of students as important in determining content taught. Forty-one percent of teachers reported previous years' end-of-grades as unimportant. Interestingly, teachers were evenly divided about the importance of state testing programs: 30% somewhat important, 29% important and extremely important. When asked to rank order the factors, teachers ranked state or national curriculum standards as the most important, local standards and curriculum guides as second in importance, followed by key concepts/principles of core disciplines. Knowledge gained from student pre-assessment and student questions/interests were ranked very low by the teachers.

Influence of Academic Needs of Student Sub-groups

Teachers were asked how much of their instructional practice was shaped by the academic needs of certain student groups and to rank the influence of the groups on their decision-making (Table 31). All of the groups were reported to have some influence on teachers' instructional practices, with average learners being reported by 62% of the teachers as having a strong influence, followed by learners with disabilities (48%), gifted learners (47%), and remedial learners (46%). Consideration of the whole class as a unit and average learners were ranked as the most important groups shaping instructional practices, followed by learners with disabilities, gifted learners, and remedial learners. Limited English Proficiency (LEP)/Bilingual learners were reported to have the least influence on the instructional decision-making of their teachers.

Table 30

Factors in Determining Instructional Content*

						Ranking (1 to 8)							
How important are each of these factors in determining the content you teach?	Not Important	Somewhat Important	Important	Extremely Important	Mean** (Std Dev)	1	2	3	4	5	6	7	8
Textbooks	10	37	43	10	2.52 (0.83)	3	6	12	9	18	19	14	19
Local standards/benchmarks/ curriculum guides	1	14	39	47	3.29 (0.79)	24	24	19	10	7	8	4	4
State or national curriculum standards	4	15	34	47	3.23 (0.89)	27	25	12	8	4	4	7	12
Knowledge gained from student pre-assessment	5	32	44	19	2.77 (0.98)	1	3	7	16	14	11	21	27
Previous year's end of grade tests	41	44	11	3	1.78 (0.93)	7	7	7	10	3	7	32	29
State testing programs	11	30	29	29	2.74 (1.06)	10	15	16	18	4	13	11	15
Teacher selected themes	9	30	48	13	2.63 (0.85)	10	5	3	7	23	16	17	19
Student questions/interests	3	28	53	17	2.81 (0.77)	2	2	4	8	18	32	20	14
Key concepts/principles of core disciplines	12	46	42	1	3.30 (0.76)	15	7	23	18	12	6	11	9
General skill level of my students	1	5	42	52	3.43 (0.69)	13	21	13	20	14	9	6	4
General readiness level of my students	2	11	40	47	3.31 (0.78)	12	15	12	16	15	13	13	5

*Figures represent percentages.
**Scale Range = 1 (Not Important) to 4 (Extremely Important)

Table 31

Ratings and Rankings of Influence of Student Group on Instructional Decision-making*

							Ranking (1 to 7)						
How much of your instructional practice is shaped by the academic needs of each of the following groups?	No Influence	Rare Influence	Some Influence	Strong Influence	Dominates	Mean** (Std Dev)	1	2	3	4	5	6	7
Culturally diverse learners	4	18	53	23	3	2.99 (0.89)	5	7	9	16	22	26	15
Remedial learners	2	12	34	46	6	3.37 (0.94)	7	14	18	22	20	13	6
LEP/Bilingual learners	20	25	37	16	1	2.50 (1.07)	1	3	9	6	19	19	43
Advanced/gifted learners	4	9	27	47	13	3.51 (1.04)	14	10	23	20	10	14	9
Learners with disabilities	4	6	37	48	6	3.41 (0.93)	2	24	24	15	12	14	7
Average learners	1	2	18	62	17	3.86 (0.84)	35	26	11	10	9	5	3
Consideration of the whole class as a single unit	4	4	30	37	25	3.69 (1.10)	37	15	7	11	7	7	16

*Figures represent percentages.
**Scale Range = 1 (No Influence) to 5 (Dominates)

Use of Particular Instructional Activities

Teachers were asked how often certain instructional activities were used in their classrooms with advanced learners and with struggling learners (Table 32). With advanced learners, learning contracts, tiered assignments, curriculum compacting, learning/interest centers, varied instructional materials, student choice, and flexible grouping based on student interests, ability, or learning profile were all strategies that teachers reported using twice a year or less. Furthermore, 83% of teachers reported never using learning contracts, 58% reported never using tiered assignments, 79% reported never compacting curriculum, and 74% reported never creating learning centers based on core content for advanced learners. In addition, 53% reported never using flexible grouping based on learning profiles. However, pre-assessment strategies, advance organizers, independent study, cooperative learning strategies, and graphic organizers were strategies reported used with advanced learners at least monthly by the majority of teachers.

In general, teachers reported more frequent use of the listed strategies for struggling learners. For example, the majority of teachers reported pre-assessing, using varied instructional materials, allowing student choices, and employing flexible grouping based on student ability/readiness level for struggling learners at least monthly. However, 45% of teachers reported never using learning contracts, 66% reported never using curriculum compacting, and 53% reported never using interest centers with struggling learners.

The responses to the use of these strategies were similar to patterns of responses reported with advanced learners. A majority of teachers reported using independent study, graphic organizers, and cooperative learning at least once a month with both groups of learners. Surprisingly, 79% of teachers reported never using curriculum compacting with advanced learners, but 66% of these teachers reported never using this strategy with struggling learners. Thirteen percent report using curriculum compacting once a month or more with struggling learners, but no teacher reported using this strategy more than once a month with advanced learners.

Use of the Classroom Accommodations

Teachers were asked how often they used particular accommodations to meet the learning needs of advanced and struggling learners (Table 33). Similar patterns were reported for both groups of learners. The majority of teachers reported using time, length, and pace adjustments for assignments, using peers as tutors, and adjusting depth of content at least weekly for both groups of learners. However, a majority of teachers reported never using tape recorded material, or rarely using adults as mentors with either type of learner. Teachers reported modifying tests (completing a written test orally) and assignments (completing a written assignment orally), individually administering a test, individually tailoring an assignment, varying materials based on student reading levels, or adjusting the length of assignments and depth of content more frequently for struggling learners than for advanced learners.

Table 32

Percentage of Teachers' Reported Use of Particular Instructional Strategies

How often are each of the following instructional strategies used in your classroom . . .	with advanced learners?							with struggling learners?						
Rating	1	2	3	4	5	6	Mean* (Std Dev)	1	2	3	4	5	6	Mean* (Std Dev)
Pre-assessment of student's current knowledge, understanding, and skills	10	7	15	36	26	7	3.76 (1.41)	8	8	13	29	33	8	3.94 (1.39)
Learning contracts	83	15	2	0	0	0	1.16 (0.45)	45	10	21	18	4	3	2.33 (1.44)
Tiered assignments (multiple assignments given to different students at the same time that are related to the same concept or topic but differ in complexity)	58	25	16	0	0	0	1.54 (0.79)	22	12	19	21	20	5	3.13 (1.62)
Advance organizer (an activity or reading which equips students with a scaffolding that connects current knowledge with new concepts and provides an organizational framework for the learning that is to follow)	17	4	8	34	26	11	3.75 (1.64)	16	5	10	27	28	14	3.83 (1.67)
Computer programs that focus on basic skills only	49	7	12	21	9	2	2.36 (1.58)	36	5	16	25	15	3	2.84 (1.62)
Computer programs that focus on problem solving, critical thinking, or advanced understanding	34	4	20	26	12	5	2.86 (1.65)	37	8	20	18	11	5	2.70 (1.64)
Independent study	7	9	20	29	22	13	3.82 (1.46)	17	12	20	25	16	10	3.40 (1.58)
Curriculum compacting (student tests out of material to be studied by rest of class and works on a different assignment)	79	12	9	0	0	0	1.27 (0.65)	66	12	8	8	4	1	1.74 (1.29)

*Scale Range = 1 (Never) to 6 (Every day)

Table 32 (continued)

Percentage of Teachers' Reported Use of Particular Instructional Strategies

How often are each of the following instructional strategies used in your classroom . . .	with advanced learners?							with struggling learners?						
Rating	1	2	3	4	5	6	Mean* (Std Dev)	1	2	3	4	5	6	Mean* (Std Dev)
Learning centers based on core content	74	17	9	0	0	0	1.31 (0.67)	44	11	16	18	8	4	2.41 (1.58)
Varied instructional materials for the same lesson	23	24	53	0	0	0	2.27 (0.86)	8	4	9	23	37	19	4.33 (1.44)
Varied instructional materials in a given unit of study	21	27	53	0	0	0	2.29 (0.84)	7	4	9	23	35	23	4.37 (1.46)
Student choices (about content, process, and/or product)	45	31	25	0	0	0	1.78 (0.83)	17	9	24	33	13	4	3.26 (1.40)
Flexible grouping based on student interest	46	30	24	0	0	0	1.75 (0.83)	18	10	23	29	16	4	3.24 (1.46)
Flexible grouping based on student ability or student readiness level	36	29	35	0	0	0	1.96 (0.87)	10	6	20	32	22	10	3.77 (1.41)
Flexible grouping based on student learning style or profile	53	22	25	0	0	0	1.69 (0.87)	24	9	20	22	16	9	3.20 (1.66)
Cooperative learning strategies	3	2	7	31	40	17	4.48 (1.22)	2	2	9	33	37	17	4.48 (1.13)
Graphic organizers (webs, semantic maps, flow charts, and other devices that allow students to view and construct relationships between ideas)	7	2	5	31	43	12	4.31 (1.33)	8	2	6	28	44	12	4.31 (1.33)
Interest centers/groups (a learning center based on student interest)	52	8	18	12	8	2	2.14 (1.47)	53	10	17	13	6	2	2.13 (1.45)

*Scale Range = 1 (Never) to 6 (Every day)

Table 33

Percentage of Teachers Reporting Use of Particular Strategies to Accommodate Student Needs

How often do you use the following strategies to accommodate the needs . . .	of advanced learners?							of struggling learners?						
Rating	1	2	3	4	5	6	Mean* (Std Dev)	1	2	3	4	5	6	Mean* (Std Dev)
Modify time student takes to complete an assignment	13	7	7	21	31	21	4.08 (1.69)	2	1	4	18	33	41	4.99 (1.18)
Tape record content material for the student to listen to	67	7	12	6	5	4	1.84 (1.44)	53	6	14	10	12	6	2.37 (1.70)
Individually administer a test other than a make up for student absence	46	13	14	18	7	2	2.30 (1.50)	23	8	18	34	15	4	3.17 (1.51)
Individually tailor an assignment as part of planning for instruction	28	8	11	22	19	11	3.24 (1.80)	16	4	12	25	24	20	3.94 (1.68)
Adjust pacing according to student's needs	8	6	4	17	21	45	4.64 (1.67)	2	1	3	16	26	52	5.17 (1.16)
Use peers as tutors	11	3	8	25	33	20	4.19 (1.58)	6	2	9	29	33	22	4.43 (1.34)
Use adults as mentors	49	19	15	9	5	4	2.12 (1.45)	43	14	17	11	9	7	2.48 (1.65)
Vary materials based on student reading levels	20	7	9	25	24	15	3.64 (1.76)	8	4	5	28	33	23	4.37 (1.47)
Adjust length of assignment according to student needs	16	4	7	19	26	30	4.17 (1.80)	4	1	6	19	33	39	4.89 (1.27)
Adjust depth of content according to student needs	14	5	7	17	27	30	4.21 (1.78)	6	1	6	19	32	36	4.76 (1.38)
Allow student to do a written test orally	51	16	18	8	3	5	2.08 (1.44)	25	9	18	30	9	8	3.12 (1.59)
Allow student to do a written assignment orally	49	12	15	13	7	4	2.25 (1.55)	32	9	19	24	12	5	2.83 (1.61)

*Scale Range = 1 (Never) to 6 (Every day)

Use of Student Grouping Arrangements

The majority of teachers reported that at least weekly they used direct instruction with the whole class, whole group seat work, and small heterogeneous groups working on the same assignments (Table 34). Forty-six percent of teachers reported daily use of direct instruction, with 32% of teachers reporting that daily the whole class worked on the same seat assignment. The majority of teachers also reported that in their classrooms the following arrangements occurred at least monthly: individual students working on independent assignments, small heterogeneous groups working on different assignments, and small homogeneous groups working on the same or different assignments.

Table 34

Use of Student Groupings

How often do your students work in the following groupings?	Never	Once per year	2x per year	1 or 2x per month	1 or 2x per week	Every day	Mean* (Std Dev)
Lecture, direct instruction, and/or discussion with the class as a whole	0	0	0	3	52	46	5.39 (0.71)
Whole group working on the same seat work	0	0	1	6	62	32	5.22 (0.73)
Individual students working on independent assignments	1	6	13	32	35	13	4.31 (1.15)
Small heterogeneous groups working on same assignment	2	0	6	29	54	10	4.59 (0.96)
Small heterogeneous groups working on different assignments	10	9	16	45	16	4	3.60 (1.29)
Small homogeneous groups working on same assignment	17	8	11	33	27	4	3.56 (1.52)
Small homogeneous groups working on different assignments	26	8	16	35	12	3	3.08 (1.53

*Scale range = 1 (Never) to 6 (Everyday)

Influence on Teacher Willingness to Try New Instructional Practices

Factors found to have the strongest influence on teacher willingness to try new instructional practices were teachers' own openness to risk, perceived benefit for their own personal/professional growth, how much their students would enjoy the new practice, and concerns about the effect on student learning in general (Table 35). A majority of teachers reported that confidence in research findings, administrator support, concerns that new practices were not developed for their students, concerns about the effect on their teaching evaluations, and concerns about the effect on student performance on standardized assessments had some influence on their willingness to try new instructional practices.

Table 35

Percentage of Teachers Reporting Willingness to Try Instructional Practices

How do the following factors influence your willingness to try new instructional practices?	No Influence	Some Influence	Strong Influence	Mean* (Std Dev)
Confidence in research findings	14	65	22	2.06 (0.61)
Administrator support	8	52	40	2.31 (0.64)
My own openness to risk in general	4	44	51	2.44 (0.62)
Perceived benefit for my own personal/professional growth	5	34	62	2.55 (0.62)
How much my students will enjoy it	1	25	74	2.72 (0.51)
Concern that new practices are not developed for students like mine	33	55	13	1.78 (0.66)
Concern about the effect on my teaching evaluation	38	52	10	1.71 (0.65)
Concern about the effect on student performance on standardized assessments	13	51	36	2.21 (0.69)
Concern about the effect on student learning in general	2	39	59	2.55 (0.58)

*Scale Range = 1 (No Influence) to 3 (Strong Influence)

Factors Influencing Differentiation

When asked how certain factors affected the degree to which they were able to differentiate instruction for the students they taught, a majority of teachers indicated that the amount of planning time (or lack thereof) was a factor that hindered them in differentiating instruction (Table 36). Budget restrictions, range of academic diversity in the classroom, and concerns about classroom management were also seen by a large proportion of teachers (42-49%) as hindering their efforts to differentiate instruction. However, their own training and expertise in differentiation (58%), their personal philosophy (59%), and the knowledge and support of other faculty (50%) were reported as factors that helped the majority of teachers differentiate instruction in the classroom. Factors that were reported by the majority to be neither hindering nor helpful included the school leadership, parent expectations, range of cultural diversity in the classroom, and district-, state-, and national-level initiatives. A large proportion of teachers (41-49%) indicated that budget restrictions, student expectations, the range of academic diversity, the school schedule, and knowledge and support of other faculty neither helped nor hindered them.

Table 36

Factors That Impact Differentiation*

Over the past year, how did each of the following factors affect the degree to which you were able to differentiate instruction for the students you taught?	Hindered Me	Neither Hindered Nor Helped Me	Helped Me	Mean** (Std Dev)
Concerns about classroom management	49	38	13	1.63 (0.71)
Administration/school leadership	10	61	29	2.18 (0.62)
Your own training and experience in differentiation	23	19	58	2.33 (0.85)
Availability of instructional materials	36	21	43	2.06 (0.90)
Budget restrictions	49	49	2	1.52 (0.56)
Amount of planning time	57	21	21	1.62 (0.82)
Personal philosophy of education	3	39	59	2.54 (0.59)
Student expectations	11	45	44	2.31 (0.70)
Parent expectations	13	56	31	2.16 (0.66)
Range of academic diversity in the classroom	42	41	17	1.74 (0.74)
Range of cultural diversity in the classroom	15	70	15	1.99 (0.57)
School schedule/blocks of time	35	47	18	1.82 (0.73)
Knowledge and support of other faculty	7	43	50	2.41 (0.65)
District-level mandates and initiatives	27	61	12	1.82 (0.64)
State-level mandates and initiatives	28	59	13	1.83 (0.64)
National-level mandates and initiatives	10	81	9	1.97 (0.47)

*Figures represent percentages.
**Scale Range = 1 (Hindered Me) to 3 (Helped Me)

Responses to New Instructional Practice Ideas

Sixty-four percent of teachers reported being enthusiastic about new instructional practices, with only 3% of teachers reporting resistance or disinterest (Table 37).

Table 37

Receptiveness to New Practices

When I read or hear about a new instructional practice, I am generally:	Percent
Enthusiastic	64
Hesitant	16
Skeptical	16
Resistant	2
Disinterested	1

Assessment of Student Outcomes

Assessing Achievement or Outcomes of Instruction

The majority of teachers reported at least monthly use of objective tests, student demonstrations, essays, or short-answer tests to assess student achievement, with objective tests being the most common method (Table 38). Student learning logs or journals were used less frequently, with 27% of teachers reporting never using them to assess student achievement or outcomes of instruction.

Table 38

Use of Assessment Strategies

How often do you use the following strategies to assess student achievement/outcome of instruction?	Never	Once per year	2x per year	1 or 2x per month	1 or 2x per week	Every day	Mean* (Std Dev)
Objective tests requiring recall of factual material only (e.g., multiple choice, fill-in-the-blank, true/false, matching)	2	4	9	59	26	0	3.99 (0.90)
Objective tests requiring analysis, synthesis, and evaluation (e.g., multiple choice, fill-in-the-blank, true/false, matching)	1	3	6	66	23	1	4.09 (0.80)
Student demonstrations or performance tasks (e.g., portfolios, projects, oral examinations)	1	0	20	58	17	4	3.99 (0.88)
Essays	10	3	18	51	18	1	3.63 (1.16)
Student learning logs or journals	27	6	8	20	23	18	3.57 (1.88)
Tests requiring a brief written response	6	1	9	60	20	4	3.93 (1.08)

*Scale Range = 1 (Never) to 6 (Every Day)

Use of Certain Types of Item Formats

The majority of teachers reported using all of the test item format options presented at least some of the time, with the least used formats being true/false-type questions and matching-type items (Table 39).

Table 39

Percentage of Teachers Reporting Use of Item Formats in Tests

How often do you use the following types of item format in your tests?	Never	Rarely	Sometimes	Often	Always	Mean* (Std Dev)
Short answer questions (e.g., fill-in-the-blank, one or two word responses, definitions)	1	8	42	42	6	3.41 (0.84)
Open-ended problems (e.g., those with several possible answers)	2	11	43	40	4	3.27 (0.89)
Essays requiring at least a paragraph response	4	15	31	42	9	3.37 (1.00)
Multiple-choice questions	1	17	32	43	7	3.35 (0.93)
True/false questions	9	34	31	23	4	2.76 (1.04)
Matching items	4	24	42	27	4	3.00 (0.94)

*Scale Range = 1 (Never) to 5 (Always)

Competency in Constructing and Using Certain Assessment Techniques

The majority of teachers felt at least quite competent in using all of the assessment techniques presented as options, with the exception of portfolios. Forty-three percent of teachers reported little competence and 11% reported no skills at all regarding competency with portfolios (Table 40). Approximately one-third of teachers reported feeling less than competent in using pre-assessment techniques or student learning logs or journals.

Table 40

Competence in Assessment Techniques

How competent do you feel in constructing and using each of the following assessment techniques?	No skills in this area	Not very competent	Quite competent	Extremely competent	Mean* (Std Dev)
Teacher-made objective tests assessing factual information only (e.g., multiple-choice, fill-in-the blank, true/false, matching)	1	2	48	49	3.47 (0.79)
Teacher-made objective tests requiring analysis, synthesis, and evaluation (e.g., multiple-choice, fill-in-the blank, true/false, matching)	1	6	58	35	3.26 (0.66)
Performance tasks in general	0	5	65	30	3.27 (0.77)
Oral examinations	3	22	57	19	3.23 (1.59)
Portfolios	11	43	36	10	2.71 (1.55)
Projects	2	9	48	41	3.29 (0.90)
Essays	3	13	54	30	3.13 (0.91)
Student learning logs or journals	6	27	41	27	2.92 (1.03)
Pre-assessment of student learning	2	29	53	16	3.03 (1.36)

*Scale Range = 1 (No Skills) to 4 (Extremely Competent)

Factors Affecting Use of Authentic Assessments

Teachers were also asked to indicate how often certain environmental factors affected the degree to which they were able to use authentic assessment strategies with students (Table 41). Teachers indicated that most factors presented neither helped nor hindered the use of authentic assessment strategies. However, the amount of planning time (or lack thereof) was reported by the majority of teachers to be a hindrance in implementing authentic assessment strategies. Teachers' own training and experience in assessment (57%) and their personal philosophy of education (58%) were considered helpful factors.

Table 41

Factors That Affect the Use of Authentic Assessment*

Over the past year, how did each of the following environmental factors affect the degree to which you were able to use authentic assessment strategies with the students you taught?	Hindered Me	Neither Hindered Nor Helped Me	Helped Me	Mean** (Std Dev)
Concerns about classroom management	39	51	10	1.69 (0.67)
Administration/school leadership	7	70	23	2.12 (0.58)
Your own training and experience in assessment	20	23	57	2.33 (0.85)
Availability of assessment materials	41	36	23	1.80 (0.81)
Budget restrictions	40	58	2	1.59 (0.55)
Amount of planning time	58	27	15	1.54 (0.75)
Personal philosophy of education	4	38	58	2.51 ((0.64)
Student expectations regarding assessment	20	50	30	2.07 (0.74)
Parent expectations regarding assessment	19	60	21	1.99 (0.68)
Range of academic diversity in the classroom	30	49	21	1.88 (0.74)
Range of cultural diversity in the classroom	18	70	13	1.92 (0.59)
School schedule/blocks of time	35	48	18	1.80 (0.73)
Knowledge and support of other faculty	4	59	37	2.29 (0.62)
District-level mandates and initiatives	23	66	10	1.84 (0.61)
State-level mandates and initiatives	25	65	10	1.84 (0.61)
National-level mandates and initiatives	13	81	7	1.91 (0.49)

*Figures represent percentages.
**Scale Range = 1 (Hindered Me) to 3 (Helped Me)

Professional Development Experiences in Assessment

Teachers were asked about the means through which they had learned more about assessing student readiness and achievement (Table 42). Fifty percent of teachers reported personal experience, 42% reported self-study, 38% reported workshops, 31% reported conferences, and 29% reported university level coursework as ways they had learned more about assessment.

Table 42

Opportunities to Learn About Assessment

Check each means through which you have learned more about assessing student readiness and achievement.	Percent
Workshop	38
Self-study/personal reading	42
Personal experience	50
University level coursework	29
Conferences	31

Grading Practices

Sixty-four percent of teachers reported that student effort was extremely important in grading decisions (Table 43), with another 31% rating the factor as important (95% rating it important or extremely important). Eighty-five percent of the teachers also reported standards for achievement and individual progress as extremely important or important. Individual achievement relative to the rest of the class was considered less important in determining grades than were the other factors. The ranking data did not present a clear pattern of importance with the exception of individual achievement relative to the class, which clearly received the lowest ranking.

Assessment Methods

Teachers were also asked the degree of importance they attached to certain assessment methods when grading and to rank the factors in order of their importance (Table 44). The majority of teachers rated all of the factors as important or extremely important in grading. Ninety-two percent of teachers rated projects, 83% rated tests/quizzes, and 63% rated homework as extremely important or important. Moreover, teachers ranked projects and tests/quizzes as the most important factors in determining grades, followed by class participation. Homework was ranked the least important factor.

Table 43

Importance of Factors in Grading*

						Ranking (1 to 4)			
What degree of importance do you attach to the following factors when grading?	Not Important	Somewhat Important	Important	Extremely Important	Mean** (Std Dev)	1	2	3	4
Individual achievement relative to the rest of the class	12	40	37	11	2.41 (0.91)	9	11	23	58
Individual improvement/ progress over the last grading period	2	14	49	36	3.11 (0.87)	20	26	38	16
Standards for achievement	1	13	52	33	3.11 (0.83)	40	15	24	21
Student effort	1	4	31	64	3.51 (0.80)	29	48	18	5

*Figures represent percentages.
**Scale Range = 1 (Not Important) to 4 (Extremely Important)

Table 44

Importance of Factors in Grading*

						Ranking (1 to 4)			
What degree of importance do you attach to the following when grading?	Not Important	Somewhat Important	Important	Extremely Important	Mean** (Std Dev)	1	2	3	4
Tests/quizzes	1	16	58	25	3.03 (0.76)	31	22	24	24
Projects demonstrating achievement other than testing	1	8	50	42	3.29 (0.71)	32	35	22	11
Homework	2	35	49	14	2.73 (0.76)	5	18	28	49
Class participation	2	13	42	44	3.25 (0.80)	29	22	30	20

*Figures represent percentages.
**Scale Range = 1 (Not Important) to 4 (Extremely Important)

Determining Criteria for Grades

The majority of teachers reported that they perceived the teacher as most often responsible for determining grading criteria, while students alone and teachers and students together only sometimes determined grading criteria (Table 45).

Table 45

Key Determinants of Grading Criteria

How often are criteria for grades in your class determined by the following factors?	Never	Rarely	Sometimes	Often	Always	Mean* (Std Dev)
The teacher	0	0	11	59	30	4.13 (0.78)
Students	11	27	47	11	4	2.66 (1.02)
Teacher and students together	9	21	48	2	1	2.83 (0.96)

*Scale Range = 1 (Never) to 5 (Always)

Other Academic Issues

The majority of teachers reported that they often or always felt confident in teaching their subjects, that planning for a differentiated classroom was worth the effort, that the ability levels of students should be taken into consideration when grading, that performance assessments provided a better assessment of student knowledge than multiple-choice tests, that students in a differentiated classroom were more likely to be actively engaged in learning, and that assessment in a differentiated classroom helped them understand student needs (Table 46). However, in contrast, 70% of teachers reported that the time and effort in planning and assessing projects were never or rarely worth the instructional benefits.

Table 46

Variety of Academic Issues*

How often do you agree with the following statements?	Never	Rarely	Sometimes	Often	Always	Mean** (Std Dev)
I feel very confident in teaching my academic subject(s).	0	1	5	48	46	4.35 (0.75)
Planning for a differentiated classroom is well worth the effort.	1	2	37	41	20	3.74 (0.87)
The ability level of the student should be taken into consideration in grading an assignment.	1	3	27	44	25	3.88 (0.89)
Class behavior should be considered in determining student grades.	32	20	30	6	11	2.43 (1.32)
Performance assessments (such as oral examinations, student demonstrations, portfolios) provide a better assessment of student knowledge than do multiple-choice tests.	0	1	37	45	17	3.75 (0.80)
Assessment in a differentiated classroom helps teachers understand student achievement and learning needs.	0	1	31	52	17	3.81 (0.76)
Curriculum compacting takes too much time to plan and carry out.	2	10	60	24	6	3.20 (0.81)
In a differentiated classroom, students are more likely to be actively engaged in learning.	2	5	33	48	12	3.61 (0.89)
The time and effort in planning and assessing projects are not worth the instructional benefits.	20	50	26	4	0	2.13 (0.80)
There is always a best way to solve a problem (such as a math or science problem).	14	27	44	12	4	2.63 (1.00)

*Figures represent percentages.
**Scale Range = 1 (Never) to 5 (Always)

Students' Perceptions of Classrooms

In addition to collecting teacher data, students in participating teachers' classrooms were asked to complete a pre- and post-project survey on their perceptions of their classrooms in the content areas of language arts, social studies, mathematics, and science.

Middle School Language Arts Classrooms

One thousand four hundred twenty-eight students (n=1,428) completed both the pre-project and the post-project surveys.

Classroom Opportunities

Students were asked the frequency with which they were provided a variety of opportunities in their language arts classroom. The majority of students indicated on both the pre- and post-surveys that, on a daily basis, they listened to the teacher lecture and worked on the same assignment as other students. In addition, a larger percentage of students reported that, at least weekly, they worked alone on drills, practicing skills, or individual contracts and participated in class discussions where the teacher seemed interested in new ways of solving problems. Students also reported rarely having individual conferences with the teacher about their work (Table 47).

Use of Pre-assessment Strategies

When asked how their teacher attempted to gather information about what they already knew prior to starting a lesson, students reported that their teachers used example activities and their performance on classroom activities more frequently than other strategies (Table 48). Students also reported that their teachers held individual conferences, reviewed a portfolio, or administered pre-tests less often, with the majority reporting these strategies used less than monthly.

Use of Classroom Accommodations

Students were asked how often they were provided particular opportunities to address their learning needs (Table 49). In general, students reported that the opportunities presented occurred less than once or twice a grading period. Specifically, the majority of students indicated that they were never allowed to skip an assignment because they already knew the material, never received different assignments or used different materials from other students, were never allowed choices in selecting class work assignments, never worked with mentors, or never had learning centers in their classroom. Over 65% of the students reported never teaching language arts to other students.

Table 47

Students' Perceptions of Opportunities in Language Arts Classrooms

	(1) Never		(2) 1-2 times a grading period		(3) 1-2 times a month		(4) 1-2 times a week		(5) 1-2 times a day		Mean* (Std Dev)	
How often do each of the following activities occur in your language arts class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I listen to the teacher lecture—the teacher talks to the class, gives information.	4	6	9	7	8	9	18	23	61	55	4.23 (1.17)	4.13 (1.21)
I take notes while the teacher lectures.	22	25	11	13	15	19	28	27	25	18	3.22 (1.49)	3.00 (1.44)
I work alone (on drills, practicing skills, reading and answering questions, doing problems).	6	7	7	7	8	11	24	28	55	48	4.16 (1.19)	4.02 (1.22)
I participate in class discussions where the teacher seems interested in new ways of solving problems.	7	10	7	8	9	11	26	31	51	41	4.07 (1.23)	3.84 (1.31)
I work on a group project.	18	14	17	29	31	36	21	14	13	6	2.94 (1.28)	2.70 (1.07)
I work in cooperative learning groups.	20	20	12	16	17	27	27	22	24	15	3.25 (1.44)	2.95 (1.33)
I do hands-on activities in class.	22	25	15	17	19	21	25	24	19	13	3.05 (1.43)	2.82 (1.38)
I have individual conferences with the teacher about my work.	50	45	19	27	13	14	11	8	7	6	2.07 (1.31)	2.04 (1.21)
One student explains subject material or assignments to another student.	31	33	12	16	15	17	22	20	20	14	2.88 (1.54)	2.66 (1.46)
I work on the same assignment as everybody in the class.	3	2	6	5	5	6	9	8	78	80	4.54 (1.01)	4.58 (0.95)
I work alone on an individual contract or independent study.	18	21	10	13	10	13	22	18	39	35	3.53 (1.53)	3.33 (1.56)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 48

Students Reporting the Use of Pre-assessment Methods in Language Arts Classroom

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does your language arts teacher use each of these techniques to find out what you already know before beginning instruction?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gives me a pre-test.	28	40	13	18	20	20	31	18	8	4	2.78 (1.36)	2.29 (1.27)
Gives me example activities.	10	15	9	12	15	18	29	29	37	27	3.73 (1.32)	3.40 (1.38)
Has an individual conference with me.	56	53	18	23	13	13	8	7	5	4	1.87 (1.20)	1.85 (1.14)
Reviews my language arts portfolio.	39	50	19	20	15	13	17	10	10	6	2.41 (1.41)	2.02 (1.26)
Looks at my performance on a project I completed.	16	17	16	23	24	27	22	17	23	15	3.21 (1.37)	2.90 (1.30)
Looks at my performance in classroom activities.	9	12	9	10	13	15	27	28	43	35	3.84 (1.31)	3.64 (1.37)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 49

Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Language Arts Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does each of the following events happen in your language arts class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am allowed to skip an assignment because I already know the material.	88	88	5	5	3	2	3	3	2	2	1.26 (0.80)	1.25 (0.79)
I receive different assignments from the other students in the class.	76	73	8	14	7	7	6	4	3	3	1.51 (1.04)	1.50 (0.98)
I use different materials than other students in the class.	71	70	8	14	8	6	7	5	6	5	1.68 (1.22)	1.61 (1.13)
I work with other students who have interests similar to mine.	32	32	14	20	15	17	20	15	19	16	2.81 (1.53)	2.63 (1.45)
My teacher places me in a group with students who have the same abilities or skill levels as I do.	37	36	13	17	15	21	16	15	19	11	2.66 (1.56)	2.49 (1.40)
I work with mentors who share my particular interests.	53	61	10	12	13	12	12	9	11	7	2.19 (1.48)	1.88 (1.30)
There are learning centers in my classroom that I visit individually or with other students.	68	76	9	8	9	7	9	5	6	4	1.76 (1.26)	1.53 (1.07)
I am given the opportunity to choose a class work assignment.	63	57	12	19	13	13	7	6	4	4	1.78 (1.19)	1.81 (1.15)
I get to choose a project from a list provided by the teacher.	42	35	21	32	22	22	8	6	7	6	2.17 (1.26)	2.16 (1.13)
I can suggest to my teacher a project that I feel demonstrates what I have learned.	42	49	18	21	21	15	9	7	12	9	2.31 (1.38)	2.06 (1.30)
My class uses learning groups.	41	44	12	17	15	18	18	13	14	9	2.52 (1.51)	2.24 (1.35)
Membership in the learning groups in my language arts class changes.	45	47	16	23	16	16	13	10	10	6	2.27 (1.41)	2.05 (1.23)
I teach language arts to other students.	68	66	12	15	8	8	7	6	6	5	1.70 (1.20)	1.70 (1.16)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Engagement in Classroom Activities

When asked about the instructional activities they engaged in during their language arts class, about half of the students reported that they were always able to keep up with instruction and assignments. A majority perceived that the teacher often or always taught material so that they could pass the end of chapter tests and do well on standardized tests. Roughly half of the students reported that they were never allowed choices about what they learned or did in class. Students also indicated that their interests were rarely considered in what they learned or activities they did (Table 50).

Perceptions About Classrooms

When asked about the degree to which they agreed with statements reflecting challenges, types of learning activities, and the environment in their language arts classroom, students tended to agree that class was a place where they learned things that were important to them, that they felt they were working to their potential, and that they preferred learning activities that would aid them in remembering information for later testing times as well as activities where new, creative, or very different ideas were encouraged, listened to, and discussed. Students also agreed that they worked best when it was for a grade, an honor, or a privilege, that they were able to work well independently, that they showed their best learning when they did a project or when they took multiple-choice tests, and that they liked the opportunity to revise and improve their work before the final grade. Students indicated that there was more to language arts than getting the right answer, but that their teachers tended to think there was a best way to answer a question (Table 51).

Factors Important in Determining Grades

When asked how important particular factors should be in determining their grades, students indicated that all the listed factors should be very important with the exception of how well they did compared to other students, which was rated much lower in importance (Table 52).

Responsibility for Determining Grading Criteria

The final question on the language arts survey asked students about who determined the criteria for grading. Students reported that rarely did they and the teacher decide together and never did they alone decide how they would be graded. Instead, the teacher was the main decision-maker, with the majority of students indicating that at least some of the time the grading criteria were clearly explained to them (Table 53).

Table 50

Engagement in Instructional Activities Reported by Students in Language Arts Classrooms

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
Now thinking about yourself and your teacher, how often does each of the following statements apply in this class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
What I do in class is too difficult.	26	26	41	44	27	26	3	3	2	2	2.14 (0.92)	2.11 (0.87)
What I do in class is too easy.	15	12	27	25	35	38	17	18	6	7	2.71 (1.09)	2.82 (1.08)
I am able to keep up with instruction.	2	2	4	4	12	12	31	32	52	50	4.27 (0.93)	4.26 (0.93)
I am able to keep up with assignments.	2	2	3	5	12	12	27	32	56	49	4.34 (0.91)	4.22 (0.97)
I have choices of what I learn about in class.	53	48	20	26	15	17	6	5	7	5	1.93 (1.22)	1.95 (1.14)
I have choices of what I do in class.	49	42	22	26	18	19	5	6	6	7	1.97 (1.21)	2.10 (1.21)
What I learn about in class is based on my interests.	33	35	26	31	28	25	8	6	4	3	2.23 (1.12)	2.12 (1.06)
Activities I do in class are based on my interests.	32	35	25	28	28	27	11	7	5	3	2.32 (1.17)	2.15 (1.08)
The teacher selects a theme or concept for me to study (such as "conflict" or "tragedy") and what I do in class is related to that theme.	18	19	12	13	25	29	26	24	19	15	3.16 (1.36)	3.02 (1.31)
The teacher teaches material so I can pass the end of unit/chapter tests.	8	7	6	8	15	16	25	27	46	43	3.96 (1.24)	3.91 (1.23)
The teacher teaches materials so I do well on standardized tests.	5	4	5	6	15	18	24	25	51	46	4.10 (1.16)	4.02 (1.14)
The lessons and material the teacher chooses seem to come right from the textbook.	9	11	16	21	31	34	25	18	19	16	3.29 (1.20)	3.07 (1.21)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Table 51

Students' Perceptions of Their Language Arts Classrooms

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your language arts class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I find the work we do in language arts to be challenging.	16	17	36	43	40	33	9	7	2.41 (0.88)	2.30 (0.83)
I have to work hard to make good grades in language arts.	8	11	18	23	41	43	32	23	2.97 (0.92)	2.78 (0.92)
The pace of my language arts class is too slow for me.	22	20	54	54	16	18	8	9	2.10 (0.83)	2.15 (0.83)
Language arts class is a place where I learn things that are important to me.	8	10	13	20	49	47	30	24	3.00 (0.88)	2.85 (0.90)
I never learn anything new in language arts.	44	39	39	44	11	10	6	8	1.80 (0.89)	1.87 (0.88)
I feel as if I am working to my potential in language arts class.	7	8	15	15	47	50	31	27	3.03 (0.87)	2.96 (0.86)
I prefer learning activities in which information is given to me to be remembered for testing at a later time.	10	13	15	20	44	41	31	27	2.96 (0.93)	2.82 (0.97)
I prefer learning activities in which new, creative, or very different ideas are encouraged, listened to, and discussed.	4	5	9	10	44	45	43	40	3.25 (0.80)	3.20 (0.81)
Language arts is easy for me.	9	8	30	24	43	47	17	21	2.68 (0.87)	2.81 (0.86)
I struggle with the basic information and skills my language arts teacher presents.	35	36	44	44	14	14	7	6	1.92 (0.88)	1.90 (0.86)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 51(continued)

Students' Perceptions of Their Language Arts Classrooms

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your language arts class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am eager to discuss ideas because I enjoy thinking about and responding to others' ideas.	10	11	20	21	44	45	25	23	2.84 (0.92)	2.80 (0.92)
I work best when I work for a grade, an honor, or a privilege.	8	7	12	13	40	42	41	38	3.13 (0.91)	3.12 (0.88)
I am easily discouraged in language arts.	31	32	45	44	17	16	7	7	2.00 (0.88)	1.98 (0.88)
I am able to work well independently (without constant teacher attention or frequent direction).	4	4	9	10	51	49	36	37	3.17 (0.77)	3.20 (0.77)
I show my best learning when I do a project.	7	9	20	23	40	39	33	29	2.98 (0.91)	2.88 (0.93)
I show my best learning when I take a multiple-choice test.	6	9	16	22	41	41	36	29	3.08 (0.88)	2.90 (0.91)
I find projects too time-consuming and too hard.	27	22	42	42	19	23	12	13	2.17 (0.96)	2.28 (0.95)
My language arts teacher is interested in finding out what I know before she/he begins teaching.	12	16	16	20	45	45	27	19	2.86 (0.95)	2.67 (0.96)
I prefer to work with students who have interests in language arts like mine.	9	8	15	15	44	48	31	29	2.98 (0.92)	2.99 (0.87)
I enjoy doing projects.	13	17	18	24	39	36	30	23	2.86 (0.99)	2.64 (1.01)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 51 (continued)

Students' Perceptions of Their Language Arts Classrooms

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your language arts class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I don't know how well I'm doing in language arts class unless I get a letter or a number grade.	11	10	29	28	37	40	23	23	2.72 (0.94)	2.76 (0.91)
Comments from my teacher are better than letter or number grades.	14	15	29	28	32	34	25	22	2.69 (1.00)	2.63 (0.99)
I like to be given the opportunity to revise and improve my work (such as written assignments, projects) before getting a final grade.	5	4	7	8	38	39	50	49	3.33 (0.81)	3.32 (0.80)
My language arts teacher thinks there is a best way to answer a question.	11	12	25	27	38	38	26	23	2.79 (0.95)	2.72 (0.95)
Most of the material I learned in language arts class I have studied before.	6	9	36	37	39	41	19	13	2.70 (0.85)	2.58 (0.83)
There is more to language arts than getting the right answer.	6	7	11	13	44	48	40	33	3.18 (0.84)	3.06 (0.86)
I liked language arts when I was younger, but now it's too hard for me.	36	32	43	45	12	14	9	9	1.95 (0.92)	2.00 (0.90)
I think that language arts has many applications in everyday life.	5	7	13	15	43	45	39	33	3.17 (0.83)	3.05 (0.86)
My language arts teacher grades fairly.	5	8	8	9	38	43	48	41	3.29 (0.84)	3.16 (0.88)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 52

Students' Perceptions of the Importance of Certain Factors in Determining Grades in Language Arts Classrooms

	Not Important		Somewhat Important		Very Important		Mean* (Std Dev)	
How important do you think each of the factors listed below *should* be in determining your grade in your language arts class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post
How I do compared to other students in my language arts class	41	44	36	35	22	21	1.81 (0.78)	1.77 (0.77)
My individual improvement or progress over the last grading period	6	6	23	26	71	67	2.65 (0.59)	2.61 (0.61)
How hard I work in class	3	4	17	20	81	76	2.78 (0.47)	2.72 (0.54)
Projects (such as a report, dramatization or model)	5	7	22	27	73	67	2.69 (0.55)	2.60 (0.62)
Assignments	3	4	24	28	73	68	2.71 (0.52)	2.64 (0.56)
Tests	3	4	10	16	87	80	2.84 (0.44)	2.75 (0.52)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Not Important) to 3 (Very Important)

Table 53

Individual Responsible for Grading Criteria in Language Arts Classrooms as Reported by Students

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
How often do the following statements about grading apply to your language arts class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
The teacher decides how we will be graded but doesn't share this with students.	23	18	27	27	25	30	12	13	12	12	2.63 (1.30)	2.73 (1.24)
The teacher decides how we will be graded and clearly explains this to students.	9	9	13	13	26	30	26	27	26	21	3.46 (1.25)	3.37 (1.21)
The teacher and students decide together how assignments or projects will be graded.	49	48	20	23	18	18	7	6	6	5	2.01 (1.22)	1.97 (1.16)
The students alone decide how they will be graded.	75	76	10	10	5	9	5	3	4	3	1.53 (1.08)	1.46 (0.95)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Middle School Mathematics Classrooms

One thousand three hundred and thirty-one students (n=1,331) completed both the pre-project and post-project surveys.

Classroom Opportunities

Students were asked about the frequency of a variety of opportunities they were provided in their mathematics classroom. The majority of students indicated that on a daily basis they listened to the teacher lecture and worked alone on drills and practicing skills. Four-fifths of the students reported working on the same assignment as everyone else on a daily basis. In addition, for both the pre- and post-surveys, students reported that at least weekly they worked on individual contracts, took notes while the teacher lectured, and participated in class discussions where the teacher seemed interested in new ways of solving problems. About half of the students reported they never had individual conferences with the teacher about their work (Table 54). These responses were similar to the responses from the language arts surveys.

Use of Pre-assessment Strategies

When asked how their teacher attempted to gather information about what they already knew before beginning a new lesson, students reported that their teachers used example activities and their performance on classroom activities most frequently (Table 55). A majority of students reported that teachers used pretests twice a month or less. Nearly half of students (48%) reported that reviews of mathematics portfolios were never used and 62% of students reported that individual conferences were never used.

Use of Classroom Accommodations

Students were asked how often particular learning opportunities were offered to them (Table 56). In general, students reported that most of the listed opportunities occurred less than once or twice a grading period. Specifically, the majority of students indicated that they were never allowed to skip an assignment because they already knew the material, never received different assignments or used different materials from other students, were never allowed choices in selecting a project or class work assignment, never worked with mentors, and never had learning centers in their classroom. These responses were similar to the responses provided to the language arts survey. Students reported they had opportunities to work with students who shared similar interests and that the teacher placed students in groups of similar abilities or skill levels more frequently than they reported the occurrences of other learning opportunities.

Table 54

Students' Perceptions of Opportunities in Mathematics Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does each of the following events happen in your mathematics class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I listen to the teacher lecture—the teacher talks to the class, gives information.	4	5	8	9	7	6	19	21	62	59	4.29 (1.12)	4.21 (1.18)
I take notes while the teacher lectures.	22	20	9	10	12	16	26	28	30	27	3.33 (1.53)	3.32 (1.46)
I work alone (on drills, practicing skills, reading and answering questions, doing problems).	6	5	7	6	9	8	22	23	57	57	4.19 (1.17)	4.20 (1.16)
I participate in class discussions where the teacher seems interested in new ways of solving problems.	7	10	7	8	9	12	27	29	50	41	4.07 (1.21)	3.83 (1.30)
I work on a group project.	22	29	15	26	28	28	23	12	12	5	2.88 (1.31)	2.37 (1.17)
I work in cooperative learning groups.	23	28	11	15	17	25	29	20	21	12	3.14 (1.45)	2.74 (1.38)
I do hands-on activities in class.	21	23	11	20	18	23	30	19	20	15	3.16 (1.43)	2.83 (1.38)
I have individual conferences with the teacher about my work.	51	43	21	29	12	14	9	9	7	6	2.00 (1.28)	2.07 (1.21)
One student explains subject material or assignments to another student.	25	26	13	13	17	17	25	26	20	18	3.03 (1.48)	2.97 (1.47)
I work on the same assignment as everybody in the class.	2	3	6	6	4	3	8	6	80	83	4.56 (0.98)	4.61 (0.97)
I work alone on an individual contract or independent study.	18	24	8	12	11	10	18	16	45	38	3.64 (1.55)	3.33 (1.63)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 55

Students' Reporting of the Use of Pre-assessment Methods in Mathematics Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does your mathematics teacher use each of these techniques to find out what you already know *before* beginning instruction?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gives me a pre-test.	27	31	14	19	24	26	27	20	8	5	2.74 (1.32)	2.48 (1.24)
Gives me example activities.	9	10	10	8	10	14	30	31	40	37	3.81 (1.31)	3.75 (1.31)
Has an individual conference with me.	62	56	17	22	9	12	8	6	4	4	1.75 (1.16)	1.80 (1.12)
Reviews my mathematics portfolio.	48	59	15	18	13	10	14	7	9	7	2.20 (1.40)	1.84 (1.24)
Looks at my performance on a project I completed.	17	27	16	22	22	22	23	15	22	15	3.17 (1.39)	2.69 (1.39)
Looks at my performance in classroom activities.	8	13	9	11	11	13	31	27	42	36	3.88 (1.27)	3.61 (1.40)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 56

Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Mathematics Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does each of the following events happen in your mathematics class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am allowed to skip an assignment because I already know the material.	91	89	3	5	2	3	2	2	2	2	1.21 (0.74)	1.22 (0.73)
I receive different assignments from the other students in the class.	79	80	8	8	5	6	4	3	4	3	1.46 (1.03)	1.40 (0.94)
I use different materials than other students in the class.	75	78	7	9	7	5	6	4	6	4	1.60 (1.18)	1.47 (1.03)
I work with other students who have interests similar to mine.	32	36	14	17	16	18	19	14	20	15	2.82 (1.54)	2.57 (1.47)
My teacher places me in a group with students who have the same abilities or skill levels as I do.	40	45	13	16	15	15	16	11	17	13	2.59 (1.55)	2.30 (1.46)
I work with mentors who share my particular interests.	55	67	11	9	12	8	13	9	9	7	2.09 (1.41)	1.81 (1.31)
There are learning centers in my classroom that I visit individually or with other students.	76	79	6	7	6	5	6	4	5	5	1.59 (1.17)	1.48 (1.08)
I am given the opportunity to choose a class work assignment.	69	67	12	14	9	10	6	4	5	5	1.65 (1.14)	1.66 (1.12)
I get to choose a project from a list provided by the teacher.	50	56	19	21	17	15	8	3	6	4	2.00 (1.24)	1.78 (1.08)
I can suggest to my teacher a project that I feel demonstrates what I have learned.	46	57	19	19	15	13	10	5	10	7	2.21 (1.38)	1.86 (1.22)
My class uses learning groups.	45	51	12	16	14	16	17	10	13	8	2.40 (1.49)	2.07 (1.31)
Membership in the learning groups in my mathematics class changes.	48	61	16	15	16	12	12	6	9	6	2.18 (1.37)	1.82 (1.22)
I teach mathematics to other students.	58	55	14	16	10	13	10	10	7	7	1.93 (1.31)	1.98 (1.29)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Engagement in Classroom Activities

When asked about the instructional activities they engaged in during class, most students reported they were often or always able to keep up with instruction and assignments, and that the teacher taught material so that they could pass the end of chapter tests or could do well on standardized tests. A large percentage of students also reported that often or always the lessons were based on the textbook. About half of the students reported that they were never given choices about what they learned about or what they did in class. Students also reported that interests rarely were the basis for what they learned or activities they completed (Table 57).

Perceptions About Classrooms

When asked the degree to which they agreed with statements concerning challenge, pace, and other factors related to learning in their mathematics classroom, students tended to agree or strongly agree that they had to work hard to make a good grade in math, that class was a place where they learned things that were important to them, that they felt they were working to their potential, and that they preferred activities where new, creative, or very different ideas were encouraged, listened to, and discussed (Table 58). Students agreed or strongly agreed that they worked best when it was for a grade, an honor, or a privilege, that they were able to work well independently, and that they showed their best learning when they did a project or when taking a multiple-choice test. Students also indicated that they liked the opportunity to revise and improve their work before the final grade. Students believed there was more to mathematics than getting the right answer, but reported their teachers thought there was a best way to answer a question. They also agreed or strongly agreed with the statement that mathematics has many applications in the everyday life.

Factors Important in Determining Grades

When asked the importance of particular factors in determining their grades, students indicated that all the factors were very important with the exception of how well they did compared to other students, which students indicated was either not important or only somewhat important (Table 59).

Responsibility for Determining Grading Criteria

When asked about who determined grading criteria for their mathematics class, the majority of students reported that rarely or never did they alone decide or did they and the teacher decide together. Instead, the teacher was the sole decision-maker in determining grades (Table 60).

Table 57

Engagement in Instructional Activities Reported by Students in Mathematics Classrooms

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
Now thinking about yourself and your teacher, how often does each of the following statements apply in this class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
What I do in class is too difficult.	20	18	40	38	32	35	6	7	2	2	2.31 (0.94)	2.37 (0.92)
What I do in class is too easy.	17	12	27	29	35	36	15	19	7	6	2.69 (1.12)	2.79 (1.05)
I am able to keep up with instruction.	1	1	3	4	13	13	33	35	49	47	4.25 (0.90)	4.22 (0.90)
I am able to keep up with assignments.	1	2	3	4	11	12	28	33	57	50	4.37 (0.88)	4.26 (0.92)
I have choices of what I learn about in class.	53	57	24	23	13	12	4	4	6	5	1.85 (1.16)	1.77 (1.20)
I have choices of what I do in class.	51	49	23	26	14	15	5	4	7	7	1.95 (1.23)	1.92 (1.17)
What I learn about in class is based on my interests.	33	44	30	28	25	20	7	5	5	3	2.21 (1.13)	1.94 (1.05)
Activities I do in class are based on my interests.	33	43	28	30	25	19	9	7	5	3	2.24 (1.16)	1.97 (1.06)
The teacher selects a theme or concept for me to study (such as "conflict" or "tragedy") and what I do in class is related to that theme.	21	29	11	15	24	22	25	19	19	16	3.08 (1.40)	2.79 (1.44)
The teacher teaches material so I can pass the end of unit/chapter tests.	6	6	7	5	15	14	22	24	50	52	4.03 (1.21)	4.11 (1.16)
The teacher teaches materials so I do well on standardized tests.	4	4	5	6	14	14	25	24	51	52	4.15 (1.10)	4.13 (1.12)
The lessons and material the teacher chooses seem to come right from the textbook.	4	5	11	12	31	30	28	25	26	29	3.61 (1.11)	3.61 (1.15)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Table 58

Students' Perceptions of Their Mathematics Classrooms

	(1) Strongly Disagree		(2) Disagree		(3) Agree		(4) Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your mathematics class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I find the work we do in mathematics to be challenging.	12	13	29	30	46	46	13	12	2.59 (0.86)	2.57 (0.86)
I have to work hard to make good grades in mathematics.	6	8	17	17	39	44	38	31	3.08 (0.89)	2.99 (0.89)
The pace of my mathematics class is too slow for me.	28	26	48	50	16	16	8	8	2.04 (0.86)	2.06 (0.86)
Mathematics class is a place where I learn things that are important to me.	8	10	11	16	42	45	39	30	3.14 (0.89)	2.94 (0.92)
I never learn anything new in mathematics.	53	53	33	35	7	7	6	5	1.67 (0.86)	1.64 (0.82)
I feel as if I am working to my potential in mathematics class.	6	8	15	16	49	48	30	28	3.03 (0.84)	2.96 (0.86)
I prefer learning activities in which information is given to me to be remembered for testing at a later time.	10	11	15	17	44	45	32	27	2.97 (0.93)	2.88 (0.93)
I prefer learning activities in which new, creative, or very different ideas are encouraged, listened to, and discussed.	4	4	9	9	47	46	40	41	3.22 (0.78)	3.23 (0.78)
Mathematics is easy for me.	11	12	29	29	40	43	21	17	2.71 (0.92)	2.66 (0.90)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 58 (continued)

Students' Perceptions of Their Mathematics Classrooms

	(1) Strongly Disagree		(2) Disagree		(3) Agree		(4) Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your mathematics class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I struggle with the basic information and skills my mathematics teacher presents.	34	35	44	44	15	15	7	6	1.95 (0.88)	1.91 (0.86)
I am eager to discuss ideas because I enjoy thinking about and responding to others' ideas.	12	14	21	24	43	43	24	20	2.79 (0.94)	2.68 (0.94)
I work best when I work for a grade, an honor, or a privilege.	6	7	12	13	38	45	43	36	3.19 (0.88)	3.09 (0.86)
I am easily discouraged in mathematics.	29	30	43	41	18	21	10	9	2.09 (0.93)	2.09 (0.92)
I am able to work well independently (without constant teacher attention or frequent direction).	4	5	11	13	52	50	33	33	3.14 (0.77)	3.10 (0.80)
I show my best learning when I do a project.	7	13	19	25	40	38	34	24	3.01 (0.90)	2.72 (0.97)
I show my best learning when I take a multiple-choice test.	6	9	17	22	42	41	35	28	3.06 (0.87)	2.88 (0.92)
I find projects too time-consuming and too hard.	26	22	45	44	18	20	12	14	2.16 (0.94)	2.26 (0.96)
My mathematics teacher is interested in finding out what I know before she/he begins teaching.	10	16	16	21	45	43	29	20	2.92 (0.92)	2.68 (0.97)
I prefer to work with students who have interests in mathematics like mine.	11	10	15	15	44	50	30	25	2.93 (0.94)	2.90 (0.89)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 58 (continued)

Students' Perceptions of Their Mathematics Classrooms

	(1) Strongly Disagree		(2) Disagree		(3) Agree		(4) Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your mathematics class.	Post	Pre	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I enjoy doing projects.	21	14	19	26	38	33	29	20	2.82 (1.01)	2.52 (1.04)
I don't know how well I'm doing in mathematics class unless I get a letter or a number grade.	12	11	27	27	36	39	26	23	2.77 (0.96)	2.73 (0.94)
Comments from my teacher are better than letter or number grades.	15	15	27	31	34	34	24	21	2.68 (1.00)	2.60 (0.97)
I like to be given the opportunity to revise and improve my work (such as written assignments, projects) before getting a final grade.	5	4	9	7	39	41	48	47	3.31 (0.80)	3.29 (0.82)
My mathematics teacher thinks there is a best way to answer a question.	10	8	23	23	44	42	25	26	2.87 (0.88)	2.84 (0.92)
Most of the material I learned in mathematics class I have studied before.	13	9	35	39	37	35	20	13	2.68 (0.89)	2.49 (0.88)
There is more to mathematics than getting the right answer.	7	4	12	14	42	45	41	34	3.20 (0.82)	3.06 (0.88)
I liked mathematics when I was younger, but now it's too hard for me.	30	35	40	43	15	18	11	10	2.01 (0.96)	2.08 (0.93)
I think that mathematics has many applications in everyday life.	6	3	9	10	36	41	52	44	3.37 (0.78)	3.22 (0.85)
My mathematics teacher grades fairly.	7	5	6	10	40	43	49	40	3.33 (0.80)	3.15 (0.88)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 59

Students' Perceptions of the Importance of Certain Factors in Determining Grades in Mathematics Classrooms

	Not Important		Somewhat Important		Very Important		Mean* (Std Dev)	
How important do you think each of the factors listed below *should* be in determining your grade in your mathematics class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post
How I do compared to other students in my mathematics class	41	42	40	39	19	19	1.78 (0.75)	1.77 (0.75)
My individual improvement or progress over the last grading period	5	6	22	25	73	69	2.68 (0.57)	2.63 (0.60)
How hard I work in class	3	4	16	21	81	75	2.78 (0.48)	2.71 (0.54)
Projects (such as a report, dramatization or model)	5	11	29	33	67	56	2.62 (0.57)	2.45 (0.68)
Assignments	2	4	23	27	75	70	2.73 (0.50)	2.66 (0.54)
Tests	2	3	10	16	88	81	2.87 (0.41)	2.78 (0.49)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 60

Individual Responsible for Grading Criteria in Mathematics Classrooms as Reported by Students

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
How often do the following statements about grading apply to your mathematics class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
The teacher decides how we will be graded but doesn't share this with students.	22	18	24	24	26	30	14	16	15	13	2.76 (1.34)	2.82 (1.26)
The teacher decides how we will be graded and clearly explains this to students.	12	11	14	17	29	29	24	26	23	18	3.32 (1.28)	3.22 (1.24)
The teacher and students decide together how assignments or projects will be graded.	49	51	23	23	17	18	7	4	5	4	1.97 (1.18)	1.88 (1.10)
The students alone decide how they will be graded.	78	77	9	11	6	5	3	4	4	4	1.46 (1.00)	1.47 (1.01)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Middle School Science Classrooms

One thousand five hundred twenty-two students (n=1,522) completed both the pre-project and post-project surveys.

Classroom Opportunities

Students were asked the frequency with which a variety of opportunities were provided in their science classroom (Table 61). The majority of students indicated that on a daily basis they listened to the teacher lecture and worked on the same assignment as other students. Almost half of the students reported working alone on drills daily. Students also reported that they worked on individual contracts, did hands-on activities, and participated in class discussions where the teacher seemed interested in new ways of solving problems at least weekly. However, students also reported rarely having individual conferences with the teacher about their work.

Use of Pre-assessment Strategies

When asked how their teacher attempted to gather information about what they already knew prior to starting a lesson, a majority of students reported that their teachers used example activities and their performance on classroom activities at least once a week (Table 62). A majority of students also reported that their teachers never used individual conferences, and that a review of a portfolio occurred twice a grading period or less.

Engagement in Classroom Activities

Students were asked how often they participated in particular learning opportunities. In general, a majority of students reported that nearly all of the opportunities presented occurred less than once or twice a grading period (Table 63). Specifically, the majority of students indicated that they were never allowed to skip an assignment because they already knew the material, never received different assignments or used different materials from other students, never worked with mentors, never visited learning centers, never taught science to other students, and were never allowed choices in selecting a project or a class work assignment. As in mathematics and language arts, students reported more frequent opportunities to work with other students who had similar interests, to be placed in groups with students of similar abilities and skills, and to work in different learning groups.

Table 61

Students' Perceptions of Opportunities in Science Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does each of the following events happen in your science class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I listen to the teacher lecture—the teacher talks to the class, gives information.	5	6	9	10	7	7	20	23	59	55	4.19 (1.19)	4.11 (1.24)
I take notes while the teacher lectures.	20	20	10	11	15	15	28	28	26	25	3.30 (1.46)	3.28 (1.46)
I work alone (on drills, practicing skills, reading and answering questions, doing problems).	7	7	7	8	11	11	27	27	49	47	4.03 (1.24)	3.99 (1.24)
I participate in class discussions where the teacher seems interested in new ways of solving problems.	7	11	8	8	9	13	27	31	49	38	4.04 (1.23)	3.78 (1.31)
I work on a group project.	14	12	17	25	29	32	29	21	12	10	3.10 (1.22)	2.91 (1.16)
I work in cooperative learning groups.	15	18	11	14	19	23	33	27	22	17	3.37 (1.34)	3.11 (1.35)
I do hands-on activities in class.	9	9	10	14	21	26	37	31	23	20	3.55 (1.21)	3.38 (1.22)
I have individual conferences with the teacher about my work.	49	46	21	25	14	12	10	10	6	8	2.02 (1.25)	2.09 (1.28)
One student explains subject material or assignments to another student.	28	32	12	17	16	19	24	18	20	15	2.97 (1.51)	2.68 (1.45)
I work on the same assignment as everybody in the class.	3	4	5	5	5	5	10	10	78	76	4.54 (1.00)	4.50 (1.05)
I work alone on an individual contract or independent study.	16	22	10	12	13	11	20	19	41	35	3.59 (1.50)	3.34 (1.58)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 62

Students' Reporting of the Use of Pre-assessment Methods in Science Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does your science teacher use each of these techniques to find out what you already know *before* beginning instruction?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gives me a pre-test.	32	36	14	16	23	22	23	18	8	8	2.61 (1.34)	2.45 (1.34)
Gives me example activities.	12	16	10	9	14	17	33	29	32	29	3.63 (1.33)	3.46 (1.40)
Has an individual conference with me.	59	53	17	21	13	12	8	8	4	6	1.80 (1.15)	1.92 (1.22)
Reviews my science portfolio.	46	46	16	19	14	13	14	13	10	10	2.27 (1.42)	2.22 (1.39)
Looks at my performance on a project I completed.	13	16	17	24	25	24	22	17	22	20	3.22 (1.34)	3.02 (1.35)
Looks at my performance in classroom activities.	9	12	10	11	12	15	26	26	43	36	3.84 (1.32)	3.64 (1.37)

Number represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 63

Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Science Classrooms

	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
How often does each of the following events happen in your science class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am allowed to skip an assignment because I already know the material.	89	87	4	6	3	3	1	2	2	3	1.24 (0.79)	1.30 (0.87)
I receive different assignments from the other students in the class.	76	75	8	9	7	7	6	6	3	3	1.50 (1.03)	1.52 (1.05)
I use different materials than other students in the class.	70	73	11	9	7	7	6	6	7	5	1.69 (1.23)	1.61 (1.17)
I work with other students who have interests similar to mine.	28	31	13	17	19	17	20	19	20	17	2.89 (1.50)	2.73 (1.47)
My teacher places me in a group with students who have the same abilities or skill levels as I do.	37	37	14	15	17	17	16	17	17	14	2.62 (1.51)	2.55 (1.46)
I work with mentors who share my particular interests.	54	57	12	11	12	12	13	11	10	9	2.13 (1.43)	2.03 (1.39)
There are learning centers in my classroom that I visit individually or with other students.	69	67	9	10	8	10	9	8	6	6	1.75 (1.26)	1.77 (1.26)
I am given the opportunity to choose a class work assignment.	66	60	13	15	11	11	6	7	5	6	1.71 (1.16)	1.85 (1.25)
I get to choose a project from a list provided by the teacher.	45	40	23	29	19	18	7	6	7	7	2.08 (1.23)	2.11 (1.19)
I can suggest to my teacher a project that I feel demonstrates what I have learned.	42	48	21	20	17	14	9	8	11	10	2.25 (1.36)	2.12 (1.35)
My class uses learning groups.	34	40	14	16	17	18	20	16	16	11	2.69 (1.50)	2.44 (1.42)
Membership in the learning groups in my science class changes.	40	46	18	19	18	15	14	12	10	9	2.35 (1.39)	2.19 (1.36)
I teach science to other students.	65	60	13	15	10	11	7	7	5	7	1.74 (1.19)	1.85 (1.25)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1 to 2 times a day)

Instructional Arrangements

When asked about the instructional activities they engaged in during class, a majority of students reported they were always or often able to keep up with instruction and assignments, and that the teacher taught material so that they could pass the end of chapter tests and do well on standardized tests (Table 64). Nearly half of the students indicated their teachers often or always based lessons directly on the textbook. In addition, a majority of students reported that they were never or rarely allowed choices about what they learned or did in class and that what they learned or activities they did were rarely or never based on their interests.

Perceptions About Classrooms

When asked the degree to which they agreed with statements concerning learning in their science classroom, a majority of students agreed or strongly agreed that class was a place where the work was challenging, that they had to work hard to make good grades, that they learned things that were important to them, that they felt they were working to their potential, and that they preferred learning activities that would aid them in remembering information for later testing times as well as activities where new, creative, or very different ideas were encouraged, listened to, and discussed (Table 65). Students also agreed or strongly agreed that they worked best when it was for a grade, an honor, or a privilege, that they were able to work well independently, that they showed their best learning when they did a project or when they took multiple-choice tests, and that they liked the opportunity to revise and improve their work before the final grade. Students indicated there was more to science than getting the right answer, but reported that their teachers thought there was a best way to answer a question. A majority of students also indicated that they disagreed or strongly disagreed with the statements that the pace of their science class was too slow, that they struggled with basic skills or information in science, and that they liked science when they were younger but now it was too hard.

Factors Important in Determining Grades

When asked the importance of particular factors in determining their grades, most students indicated that all the factors should be very important with the exception of how well they did when compared to other students, which was considered by over 40% of the students as not important (Table 66).

Responsibility for Determining Grading Criteria

The final question asked students about who was responsible for determining grading criteria for their science class. The majority of students reported that rarely did students and teachers together determine the criteria for grades and never did students alone decide how they would be graded (Table 67). Instead, students reported that teachers were the main decision-maker, with the majority of students indicating that at least sometimes the grading criteria were clearly explained to them. However, more than 40% reported that the grading criteria were rarely or never shared with them.

Table 64

Engagement in Instructional Activities Reported by Students in Science Classrooms

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
Now thinking about yourself and your teacher, how often does each of the following statements apply in this class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
What I do in class is too difficult.	22	24	41	42	30	28	5	4	2	3	2.25 (0.93)	2.19 (0.93)
What I do in class is too easy.	14	13	27	30	37	35	16	15	7	7	2.74 (1.09)	2.72 (1.08)
I am able to keep up with instruction.	2	2	3	4	13	15	32	32	51	47	4.27 (0.90)	4.19 (0.96)
I am able to keep up with assignments.	2	3	3	3	12	14	28	29	56	52	4.33 (0.93)	4.24 (0.98)
I have choices of what I learn about in class.	50	47	22	24	16	17	6	6	6	6	1.95 (1.18)	2.00 (1.20)
I have choices of what I do in class.	47	43	24	24	17	20	5	6	7	7	2.00 (1.21)	2.10 (1.23)
What I learn about in class is based on my interests.	32	36	27	26	27	26	8	7	6	5	2.27 (1.15)	2.19 (1.14)
Activities I do in class are based on my interests.	30	33	27	27	26	28	10	9	7	4	2.37 (1.20)	2.24 (1.12)
The teacher selects a theme or concept for me to study (such as "conflict" or "tragedy") and what I do in class is related to that theme.	18	21	11	12	26	25	24	23	21	18	3.19 (1.37)	3.05 (1.39)
The teacher teaches material so I can pass the end of unit/chapter tests.	6	6	5	6	16	18	23	26	50	44	4.07 (1.17)	3.96 (1.18)
The teacher teaches materials so I do well on standardized tests.	4	5	5	6	15	18	26	26	50	45	4.13 (1.09)	4.00 (1.16)
The lessons and material the teacher chooses seem to come right from the textbook.	8	7	19	14	33	32	22	24	18	23	3.23 (1.17)	3.42 (1.18)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Table 65

Students' Perceptions of Their Science Classroom

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your science class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I find the work we do in science to be challenging.	12	14	34	34	43	42	10	9	2.51 (0.84)	2.46 (0.85)
I have to work hard to make good grades in science.	7	9	21	19	37	44	35	28	3.01 (0.92)	2.90 (0.91)
The pace of my science class is too slow for me.	24	22	51	53	16	18	9	8	2.10 (0.87)	2.13 (0.84)
Science class is a place where I learn things that are important to me.	6	10	14	16	47	48	32	26	3.05 (0.85)	2.91 (0.90)
I never learn anything new in science.	51	44	36	39	8	10	6	8	1.69 (0.85)	1.82 (0.90)
I feel as if I am working to my potential in science class.	7	7	16	18	46	46	31	29	3.01 (0.86)	2.98 (0.86)
I prefer learning activities in which information is given to me to be remembered for testing at a later time.	12	12	14	19	43	40	32	29	2.95 (0.96)	2.86 (0.96)
I prefer learning activities in which new, creative, or very different ideas are encouraged, listened to, and discussed.	4	6	7	11	44	45	46	39	3.29 (0.78)	3.17 (0.84)
Science is easy for me.	9	10	31	28	42	43	19	19	2.70 (0.87)	2.71 (0.89)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 65 (continued)

Students' Perceptions of Their Science Classroom

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your science class.	Post	Pre	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I struggle with the basic information and skills my science teacher presents.	33	33	43	43	15	16	9	8	1.99 (0.92)	1.99 (0.90)
I am eager to discuss ideas because I enjoy thinking about and responding to others' ideas.	14	10	20	20	46	43	24	23	2.83 (0.91)	2.74 (0.97)
I work best when I work for a grade, an honor, or a privilege.	9	7	12	13	40	41	41	37	3.15 (0.89)	3.06 (0.93)
I am easily discouraged in science.	31	31	46	43	15	18	9	8	2.02 (0.89)	2.03 (0.90)
I am able to work well independently (without constant teacher attention or frequent direction).	5	4	11	11	49	50	36	34	3.18 (0.77)	3.12 (0.81)
I show my best learning when I do a project.	11	7	18	22	41	37	35	30	3.03 (0.90)	2.86 (0.97)
I show my best learning when I take a multiple-choice test.	9	8	15	20	40	39	37	32	3.06 (0.91)	2.94 (0.93)
I find projects too time-consuming and too hard.	23	26	45	40	18	23	12	14	2.16 (0.94)	2.29 (0.97)
My science teacher is interested in finding out what I know before she/he begins teaching.	17	11	16	20	49	44	24	20	2.85 (0.91)	2.67 (0.97)
I prefer to work with students who have interests in science like mine.	9	9	15	14	44	48	32	29	3.00 (0.91)	2.98 (0.88)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 65 (continued)

Students' Perceptions of Their Science Classroom

	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
We are interested in how well each one of the following statements describes the way you feel about your science class.	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I enjoy doing projects.	12	17	19	22	37	37	32	24	2.90 (0.98)	2.69 (1.02)
I don't know how well I'm doing in science class unless I get a letter or a number grade.	11	11	27	27	37	38	25	24	2.75 (0.96)	2.75 (0.94)
Comments from my teacher are better than letter or number grades.	14	16	28	30	32	33	27	21	2.72 (1.01)	2.60 (1.00)
I like to be given the opportunity to revise and improve my work (such as written assignments, projects) before getting a final grade.	4	5	8	9	38	40	50	46	3.34 (0.80)	3.28 (0.82)
My science teacher thinks there is a best way to answer a question.	10	11	22	27	40	39	29	24	2.88 (0.94)	2.76 (0.94)
Most of the material I learned in science class I have studied before.	9	2	41	44	35	31	15	13	2.56 (0.85)	2.45 (0.87)
There is more to science than getting the right answer.	5	9	8	13	43	45	43	33	3.24 (0.82)	3.04 (0.90)
I liked science when I was younger, but now it's too hard for me.	35	30	42	43	13	16	10	11	1.98 (0.93)	2.07 (0.95)
I think that science has many applications in everyday life.	6	8	12	16	43	44	39	33	3.15 (0.86)	3.02 (0.91)
My science teacher grades fairly.	5	7	9	11	39	42	48	40	3.29 (0.83)	3.16 (0.88)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 66

Students' Perceptions of the Importance of Certain Factors in Determining Grades in Science Classrooms

	Not Important		Somewhat Important		Very Important		Mean* (Std Dev)	
How important do you think each of the factors listed below *should* be in determining your grade in your science class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post
How I do compared to other students in my science class	41	44	39	34	21	22	1.80 (0.76)	1.79 (0.78)
My individual improvement or progress over the last grading period	5	7	21	25	74	68	2.69 (0.56)	2.62 (0.61)
How hard I work in class	4	6	16	20	81	74	2.77 (0.50)	2.68 (0.58)
Projects (such as a report, dramatization, or model)	3	6	24	27	74	67	2.71 (0.52)	2.61 (0.60)
Assignments	2	4	25	28	73	68	2.71 (0.50)	2.64 (0.56)
Tests	2	4	10	15	88	81	2.86 (0.40)	2.77 (0.51)

Numbers in each cell represent percentage of students reporting.
*Scale = 1 (Not Important) to 3 (Very Important)

Table 67

Individual Responsible for Grading Criteria in Science Classrooms as Reported by Students

	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
How often do the following statements about grading apply to your science class?	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
The teacher decides how we will be graded but doesn't share this with students.	21	19	25	24	26	30	14	13	13	14	2.72 (1.31)	2.79 (1.28)
The teacher decides how we will be graded and clearly explains this to students.	11	12	13	15	27	29	26	26	23	19	3.38 (1.27)	3.25 (1.25)
The teacher and students decide together how assignments or projects will be graded.	46	49	25	20	17	18	7	7	6	6	2.03 (1.21)	1.99 (1.20)
The students alone decide how they will be graded.	76	75	10	9	6	8	5	5	4	3	1.51 (1.05)	1.53 (1.04)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Middle School Social Studies Classrooms

One thousand four hundred thirty-six students (n=1,436) completed both the pre- and post-surveys.

Classroom Opportunities

Students were asked the frequency with which they were provided a variety of opportunities in their social studies classroom (Table 68). The majority of students indicated that listening to the teacher lecture and working on the same assignment as other students occurred on a daily basis while working alone (on drills, etc.) occurred weekly. Students reported that they listened to the teacher lecture, worked on individual contracts, and participated in class discussions where the teacher seemed interested in new ways of solving problems at least weekly. Students also reported rarely having individual conferences with the teacher about their work.

Use of Pre-assessment Strategies

When asked how their teacher attempted to gather information about what they already knew prior to starting a new lesson, the majority of students reported that their teachers used example activities and their performance on classroom activities at least once a week (Table 69). According to the majority of students, review of social studies portfolios and individual conferences were used twice a grading period or less.

Instructional Arrangements

When presented with a list of possible ways teachers might adapt instruction to meet student learning needs, the majority of students reported that nearly all of the opportunities occurred less than once or twice a grading period (Table 70). Specifically, the majority of students indicated that they were never allowed to skip an assignment because they already knew the material, never received different assignments or used different materials from other students, never worked with mentors, never worked in learning centers, never taught other students, and were never allowed choices in selecting a project or class work assignment.

Engagement in Classroom Activities

When asked about the level of challenge, choices, the environment, and instructional activities in their class, the majority of students reported that they were always able to keep up with instruction and assignments. The majority of students also reported that the teacher taught material so that they could pass the end of chapter tests and do well on standardized tests (Table 71). Approximately half of the students reported the lessons were often or always based on the textbook. The majority of students also reported rarely or never being allowed choices about what they learned or did in class. Students also indicated that what they learned or activities they did were rarely or never based on their interests.

Table 68

Students' Perceptions of Opportunities in Social Studies Classrooms

How often does each of the following events happen in your social studies class?	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I listen to the teacher lecture—the teacher talks to the class, gives information.	5	5	7	8	8	7	19	21	61	58	4.24 (1.17)	4.18 (1.20)
I take notes while the teacher lectures.	19	20	10	10	15	16	30	32	27	22	3.36 (1.44)	3.26 (1.43)
I work alone (on drills, practicing skills, reading and answering questions, doing problems).	7	7	6	8	10	10	25	27	52	48	4.10 (1.21)	4.01 (1.23)
I participate in class discussions where the teacher seems interested in new ways of solving problems.	7	9	7	8	10	12	25	27	50	45	4.04 (1.24)	3.90 (1.30)
I work on a group project.	16	14	20	28	31	35	22	17	11	7	2.93 (1.22)	2.75 (1.10)
I work in cooperative learning groups.	18	22	12	15	21	24	28	25	20	15	3.19 (1.38)	2.94 (1.37)
I do hands-on activities in class.	19	21	16	20	20	21	25	25	20	14	3.10 (1.40)	2.90 (1.35)
I have individual conferences with the teacher about my work.	53	48	20	25	11	14	10	8	7	5	1.98 (1.29)	1.99 (1.19)
One student explains subject material or assignments to another student.	36	39	11	15	14	17	22	17	17	12	2.74 (1.55)	2.47 (1.44)
I work on the same assignment as everybody in the class.	2	4	5	4	5	6	9	11	79	75	4.57 (0.96)	4.50 (1.03)
I work alone on an individual contract or independent study.	16	23	8	12	11	13	21	19	45	34	3.70 (1.49)	3.29 (1.58)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 69

Students' Reporting of the Use of Pre-assessment Methods in Social Studies Classrooms

How often does your social studies teacher use each of these techniques to find out what you already know *before* beginning instruction?	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Gives me a pre-test.	33	38	13	18	23	20	23	17	7	7	2.57 (1.34)	2.39 (1.33)
Gives me example activities.	13	19	10	9	15	16	30	30	32	26	3.59 (1.37)	3.33 (1.44)
Has an individual conference with me.	62	55	17	22	10	12	7	8	4	4	1.73 (1.12)	1.84 (1.15)
Reviews my social studies portfolio.	48	50	16	18	13	13	15	10	9	9	2.22 (1.41)	2.09 (1.35)
Looks at my performance on a project I completed.	14	15	17	23	27	30	20	15	22	17	3.19 (1.33)	2.95 (1.30)
Looks at my performance in classroom activities.	10	12	9	11	12	14	28	26	40	36	3.79 (1.33)	3.62 (1.39)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 70

Students' Perceptions of Opportunities Provided for Meeting Their Learning Needs in Social Studies Classrooms

How often does each of the following events happen in your social studies class?	Never		1-2 times a grading period		1-2 times a month		1-2 times a week		1-2 times a day		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I am allowed to skip an assignment because I already know the material.	91	88	4	4	2	4	1	2	2	3	1.21 (0.73)	1.29 (0.86)
I receive different assignments from the other students in the class.	79	74	7	10	6	8	5	4	3	4	1.46 (1.02)	1.55 (1.06)
I use different materials than other students in the class.	72	73	10	9	8	8	5	6	5	4	1.61 (1.15)	1.58 (1.12)
I work with other students who have interests similar to mine.	31	33	15	18	16	19	20	16	18	14	2.80 (1.51)	2.61 (1.44)
My teacher places me in a group with students who have the same abilities or skill levels as I do.	38	37	13	17	18	20	14	13	18	12	2.62 (1.53)	2.46 (1.41)
I work with mentors who share my particular interests.	56	57	10	11	12	14	12	10	10	9	2.09 (1.43)	2.04 (1.39)
There are learning centers in my classroom that I visit individually or with other students.	70	71	9	10	8	8	8	7	6	5	1.70 (1.23)	1.65 (1.17)
I am given the opportunity to choose a class work assignment.	65	56	13	17	11	13	7	8	6	6	1.76 (1.21)	1.92 (1.25)
I get to choose a project from a list provided by the teacher.	43	38	19	30	24	20	8	6	6	6	2.17 (1.24)	2.12 (1.15)
I can suggest to my teacher a project that I feel demonstrates what I have learned.	46	49	18	19	16	14	11	9	10	9	2.22 (1.39)	2.09 (1.33)
My class uses learning groups.	41	44	13	16	16	16	18	14	12	10	2.47 (1.46)	2.30 (1.41)
Membership in the learning groups in my social studies class changes.	44	48	17	17	17	15	13	10	9	9	2.25 (1.37)	2.15 (1.36)
I teach social studies to other students.	69	61	11	16	8	10	6	7	6	6	1.69 (1.21)	1.80 (1.21)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (1-2 times a day)

Table 71

Engagement in Instructional Activities Reported by Students in Social Studies Classrooms

Now thinking about yourself and your teacher, how often does each of the following statements apply in this class?	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
What I do in class is too difficult.	26	28	40	41	28	25	4	4	1	2	2.15 (0.90)	2.12 (0.94)
What I do in class is too easy.	15	14	27	26	33	34	17	18	7	8	2.74 (1.13)	2.78 (1.13)
I am able to keep up with instruction.	1	2	4	4	12	11	29	31	54	52	4.32 (0.91)	4.26 (0.96)
I am able to keep up with assignments.	2	2	2	4	10	12	28	30	58	52	4.38 (0.90)	4.26 (0.95)
I have choices of what I learn about in class.	51	47	23	22	15	17	4	7	7	6	1.93 (1.20)	2.03 (1.22)
I have choices of what I do in class.	49	43	21	24	17	19	5	8	8	7	2.01 (1.24)	2.12 (1.24)
What I learn about in class is based on my interests.	34	37	26	26	28	24	6	8	6	5	2.23 (1.15)	2.19 (1.16)
Activities I do in class are based on my interests.	31	36	27	24	28	26	9	9	6	5	2.32 (1.17)	2.24 (1.17)
The teacher selects a theme or concept for me to study (such as "conflict" or "tragedy") and what I do in class is related to that theme.	15	18	13	12	24	27	26	23	23	21	3.29 (1.34)	3.17 (1.36)
The teacher teaches material so I can pass the end of unit/chapter tests.	6	5	7	7	15	15	23	26	49	47	4.01 (1.22)	4.04 (1.16)
The teacher teaches materials so I do well on standardized tests.	4	5	5	7	16	16	25	24	50	49	4.11 (1.11)	4.04 (1.17)
The lessons and material the teacher chooses seem to come right from the textbook.	6	9	14	14	29	29	25	23	26	26	3.50 (1.20)	3.44 (1.23)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Perceptions About Classrooms

When asked the degree to which they agreed with statements concerning their learning in their social studies classroom, students tended to agree that class was a place where they learned things that were important to them, that they worked hard to make good grades, that they felt they were working to their potential, and that they preferred learning activities that would aid them in remembering information for later testing times as well as activities in which new, creative, or very different ideas were encouraged, listened to, and discussed (Table 72). Students also agreed they worked best when it was for a grade, an honor, or a privilege, they were able to work well independently, they showed their best learning when they did a project or when they took multiple-choice tests, and they liked the opportunity to revise and improve their work before the final grade. Students indicated there was more to social studies than getting the right answer and that social studies has many applications in real life. They also felt grading was fair in the social studies classrooms. The students in the social studies classrooms were less likely than the other content areas to report their social studies teacher believed that there was a best right answer.

Factors Important in Determining Grades

When asked the importance of particular factors in determining their grades, the majority of students indicated all the factors should be very important with the exception of how well they did when compared to other students (Table 73).

Responsibility for Determining Grading Criteria

The final question asked of students pertained to who was responsible for determining the grading criteria in their social studies class. The majority of students reported they rarely or never decided on grading together with the teacher and they never decided alone how they would be graded (Table 74). Instead, the teacher was the main decision-maker, with the majority of students indicating at least sometimes the grading criteria were clearly explained to them.

Table 72

Students' Perceptions of Their Social Studies Classroom

We are interested in how well each one of the following statements describes the way you feel about your social studies class.	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I find the work we do in social studies to be challenging.	15	16	35	38	41	37	9	10	2.44 (0.86)	2.40 (0.87)
I have to work hard to make good grades in social studies.	8	10	21	22	41	42	30	26	2.93 (0.91)	2.85 (0.92)
The pace of my social studies class is too slow for me.	21	21	53	52	16	18	10	9	2.15 (0.87)	2.14 (0.85)
Social studies class is a place where I learn things that are important to me.	10	9	15	17	46	46	30	28	2.97 (0.91)	2.93 (0.90)
I never learn anything new in social studies.	45	42	38	42	10	9	6	7	1.77 (0.87)	1.81 (0.86)
I feel as if I am working to my potential in social studies class.	6	6	17	17	45	50	31	26	3.01 (0.86)	2.96 (0.83)
I prefer learning activities in which information is given to me to be remembered for testing at a later time.	9	12	16	17	44	39	32	32	2.99 (0.91)	2.91 (0.98)
I prefer learning activities in which new, creative or very different ideas are encouraged, listened to and discussed.	4	5	9	11	42	43	45	42	3.29 (0.78)	3.20 (0.83)
Social studies is easy for me.	10	10	31	27	39	41	19	21	2.68 (0.90)	2.73 (0.91)
I struggle with the basic information and skills my social studies teacher presents.	37	36	42	41	15	15	7	8	1.92 (0.89)	1.95 (0.91)
I am eager to discuss ideas because I enjoy thinking about and responding to others' ideas.	11	12	20	21	44	40	25	27	2.82 (0.93)	2.82 (0.97)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 72 (continued)

Students' Perceptions of Their Social Studies Classroom

We are interested in how well each one of the following statements describes the way you feel about your social studies class.	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I work best when I work for a grade, an honor, or a privilege.	7	9	11	10	39	41	43	39	3.18 (0.89)	3.12 (0.92)
I am easily discouraged in social studies.	33	34	43	42	16	15	8	8	1.98 (0.90)	1.98 (0.91)
I am able to work well independently (without constant teacher attention or frequent direction).	5	4	8	9	49	50	38	37	3.20 (0.79)	3.20 (0.77)
I show my best learning when I do a project.	7	10	21	22	37	37	36	32	3.03 (0.91)	2.90 (0.96)
I show my best learning when I take a multiple-choice test.	7	9	16	20	40	40	37	32	3.07 (0.89)	2.94 (0.93)
I find projects too time-consuming and too hard.	27	23	43	39	19	23	12	15	2.15 (0.94)	2.30 (0.99)
My social studies teacher is interested in finding out what I know before she/he begins teaching.	13	14	18	20	46	43	23	23	2.89 (0.94)	2.75 (0.97)
I prefer to work with students who have interests in social studies like mine.	9	8	15	15	46	47	31	30	2.98 (0.90)	2.98 (0.88)
I enjoy doing projects.	12	16	19	22	38	36	31	26	2.87 (0.99)	2.71 (1.03)
I don't know how well I'm doing in social studies class unless I get a letter or a number grade.	12	11	27	26	37	39	24	24	2.73 (0.96)	2.76 (0.94)
Comments from my teacher are better than letter or number grades.	15	15	28	28	33	32	24	26	2.66 (1.00)	2.69 (1.01)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 72 (continued)

Students' Perceptions of Their Social Studies Classroom

We are interested in how well each one of the following statements describes the way you feel about your social studies class.	Strongly Disagree		Disagree		Agree		Strongly Agree		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
I like to be given the opportunity to revise and improve my work (such as written assignments, projects) before getting a final grade.	4	4	8	9	39	39	49	48	3.32 (0.80)	3.32 (0.79)
My social studies teacher thinks there is a best way to answer a question.	10	14	26	26	38	36	26	25	2.80 (0.94)	2.72 (0.98)
Most of the material I learned in social studies class I have studied before.	9	14	43	43	33	30	16	13	2.55 (0.86)	2.43 (0.89)
There is more to social studies than getting the right answer.	6	6	10	13	47	45	38	36	3.17 (0.82)	3.12 (0.85)
I liked social studies when I was younger, but now it's too hard for me.	33	31	46	46	11	14	10	9	1.97 (0.91)	2.02 (0.91)
I think that social studies has many applications in everyday life.	7	10	18	20	44	42	31	29	2.99 (0.88)	2.91 (0.94)
My social studies teacher grades fairly.	6	7	8	8	41	39	46	47	3.27 (0.83)	3.26 (0.86)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Strongly Disagree) to 4 (Strongly Agree)

Table 73

Students' Perceptions of the Importance of Certain Factors in Determining Grades in Social Studies Classrooms

How important do you think each of the factors listed below *should* be in determining your grade in your social studies class?	Not Important		Somewhat Important		Very Important		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
How I do compared to other students in my social studies class	42	42	37	36	21	22	1.80 (0.78)	1.80 (0.78)
My individual improvement or progress over the last grading period	6	7	24	26	70	68	2.64 (0.60)	2.61 (0.61)
How hard I work in class	3	3	17	21	81	76	2.78 (0.48)	2.72 (0.52)
Projects (such as a report, dramatization or model)	4	6	23	26	73	69	2.70 (0.54)	2.63 (0.59)
Assignments	2	3	24	27	74	70	2.72 (0.51)	2.66 (0.54)
Tests	2	4	10	16	88	80	2.85 (0.43)	2.77 (0.50)

Numbers in each cell represent percentage of students reporting.
*Scale = 1 (Not Important) to 3 (Very Important)

Table 74

Individual Responsible for Grading Criteria in Social Studies Classrooms as Reported by Students

How often do the following statements about grading apply to your social studies class?	Never		Rarely		Sometimes		Often		Always		Mean* (Std Dev)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
The teacher decides how we will be graded but doesn't share this with students.	22	21	25	27	27	25	13	14	13	13	2.70 (1.31)	2.73 (1.30)
The teacher decides how we will be graded and clearly explains this to students.	11	11	13	14	28	28	24	26	24	21	3.35 (1.29)	3.32 (1.27)
The teacher and students decide together how assignments or projects will be graded.	50	48	20	20	19	20	6	7	6	5	2.00 (1.22)	2.03 (1.20)
The students alone decide how they will be graded.	77	73	9	11	6	9	4	4	4	4	1.48 (1.04)	1.54 (1.04)

Numbers in each cell represent percentage of students reporting.
*Scale Range = 1 (Never) to 5 (Always)

Teachers' Summary

Student responses to many of the questions were similar regardless of subject area considered. Teachers' responses sometimes confirmed and sometimes differed from the pattern of responses of the students (Tables 75 and 76).

The majority of students in all classrooms reported listening to the teacher lecture, working alone on drills, and working on the same assignment as other students daily. In addition, students reported working alone on individual contracts and participating in class discussions where the teacher seemed interested in new ways of solving problems at least weekly. The majority of students also reported never having individual conferences with the teachers.

Teachers' responses also reflected the student responses regarding typical instructional practice in all subject area classrooms. The majority of teachers reported using learning contracts less than once per year and using independent studies only twice a year or less. Teachers also indicated using lecture, whole group, and small heterogeneous groups working on the same assignment at least weekly, while individuals and small heterogeneous groups working on different assignments and small homogeneous groups working on the same assignment were used less often.

Students from all areas reported that teachers used example activities and performance on classroom activities to assess what they already knew prior to instruction at least weekly. However, the majority of students reported that they were never allowed to skip an assignment because they already knew the material, never received different materials or assignments from other students, and were never allowed choices in selecting a project or class work. Teachers agreed with students on the type of pre-assessment strategies used and the frequency of their use. Teachers also reported they never or rarely used student choices with advanced learners or struggling learners. However, teachers indicated they used varying materials based on students reading level and adjusted the time, length, or depth of the assignment at least monthly for both groups of learners.

Students in all areas reported they were often or always able to keep up with the instruction and assignments. The majority of students reported the teacher often or always taught material so they could pass the end of chapter tests, and nearly half of the students reported lessons were often or always based directly on the textbook. Additionally, students indicated rarely or never were their interests considered in what they learned or activities they did, nor were they allowed choices about what they learn. Teachers agreed that the textbook was frequently used, however, in contrast to student responses, teachers believed students' interests were addressed. The majority of teachers indicated textbooks and student questions and interests were important or extremely important in determining the content they taught.

Table 75

Middle School Classrooms: Teachers' Practices and Similar Students' Perceptions of Practices as Reported by the Majority of Teachers and Students

Teachers' reported practices	Student perceptions
Never use learning centers in their classrooms	Never visit learning centers in classrooms individually or with other students
Varied instructional materials for the same lesson or in a given unit of study. • Less than twice a year with advanced learners • Monthly with struggling learners	Never use different materials than other students in the class
Use of student choices about content, process, and/or product used twice a year or less	Never given the opportunity to . . . • choose a class work assignment • choose a project from a list provided by the teacher • suggest to my teacher a project that I feel demonstrates what I have learned • make choices of what I learn about in class • make choices of what I do in class
Weekly use of cooperative learning strategies	On a weekly basis, • I work in cooperative learning groups. • My class uses learning groups.
• Never use interest centers/groups (a learning center based on student interest) • Never use flexible grouping based on student interest	Never am allowed to work with other students who have interests similar to mine
Never use adults as mentors	Never work with mentors who share their interests
• At least monthly adjustment of the length of assignment according to student needs • At least weekly adjustment of depth of content according to student needs	• I work on the same assignment as everybody in the class on a daily basis • I never receive different assignments from the other students in the class
Lecture, direct instruction, and/or discussion with the class as a whole used on a daily basis	• Daily the teacher lectures • Daily note-taking occurs while the teacher lectures
PRE-ASSESSMENT • Monthly use of a pre-test • Weekly use of example activities • Rarely have individual conferences • Portfolios never used • At least weekly observation of student responses and discussion	PRE-ASSESSMENT • Monthly use of pre-test • Weekly gives me example activities • Never has an individual conference • Never reviews my portfolio • Daily looks at my performance in classroom activities

Table 75 (continued)

Middle School Classrooms: Teachers' Practices and Similar Students' Perceptions of Practices as Reported by the Majority of Teachers and Students

Teachers' reported practices	Student perceptions
Textbooks important in determining the content taught	• The lessons and material the teacher chooses seem to come right from the text-book • The teacher always teaches material so I can pass the end of unit/chapter tests
Individual achievement relative to the rest of the class somewhat important when grading	How do I compare to other students in my class is only somewhat important
Individual improvement/progress over last grading period is important when grading	My individual improvement or progress over the last grading period is very important
Student effort is extremely important when grading	How hard I work in class is very important in determining my grade
How often are criteria for grades in your classroom determined by the following factors? • The teacher—often • Students—sometimes • Teacher and students together—sometimes	How often do the following statements about grading apply to your class? • The teacher *sometimes* decides how we will be graded but doesn't share this with students • Teacher and students together *never* determine how assignments or projects will be graded • The students alone *never* decide how they will be graded

Table 76

Middle School Classrooms: Teachers' Practices and Dissimilar Students' Perceptions of Practices as Reported by the Majority of Teachers and Students

Teachers' reported practices	Student perceptions
Learning contracts are never used	At least weekly I work alone on an individual contract or independent study
Use peers as tutors used at least weekly	I never teach other students
Weekly the whole group works on the same seat work	I work on the same assignment as everybody in the class daily
At least monthly use of individual students working on independent assignments	• I work on the same assignment as everybody in the class on a daily basis • I never receive different assignments from the other students in the class • At least weekly I work alone on an individual contract or independent study
At least monthly observation of student performance on project or product as a pre-assessment strategy	At least weekly the teacher looks at performance on project I completed as a Pre-assessment strategy
Student questions/interests are important in determining the content they teach	• I *never* have choices of what I learn about in class • I *never* have choices of what I do in class • What I learn about in class is based on my interests only *sometimes* • Activities I do in class are based on my interests only *sometimes*

Most students agreed or strongly agreed they worked well independently, worked best for a grade, honor, or privilege, and showed their best learning when they did a project or took multiple choice tests. In addition, students agreed or strongly agreed they preferred learning activities that would aid them in remembering information for later testing times, as well as activities where new, creative, or very different ideas are encouraged, listened to, and discussed. Students in all content areas agreed or strongly agreed they were learning things that were important to them, they were working to their potential, and they preferred to work with students who shared similar interests. Furthermore, students agreed or strongly agreed that they liked the opportunity to revise their work before the final grade and that there was more to a subject than getting the right answer, but the teacher tended to think that there was a best way to answer a question. Teacher responses suggested there was not a match between the student's preferred learning style and the teaching style. In contrast to student preferences, teachers indicated rarely or never using flexible grouping based on student interest with advanced learners, and only sometimes with struggling learners. Teachers reported using projects to assess student achievement twice a month or less. Teachers also reported inconsistent use of multiple choice items, with 50% indicating using these items sometimes to never, while the other 50% used multiple choice items often or always.

The majority of students reported that the teacher was often or always the decision maker when it came to grades. However, a large percentage of students indicated the teacher in some instances clearly explained the grading criteria. Students from all areas indicated tests, assignments, projects, hard work, and individual improvement were all very important in determining their grade. In addition, students reported how they did compared to other students was not important. Teacher responses on grading issues tended to agree with the student responses. The majority of teachers reported themselves sole-decision maker when it came to grades. Teachers also indicated tests, projects, homework, class participation, and individual improvement were all important or extremely important in determining grades. However, teachers reported effort was extremely important, while how the student did compared to the rest of the class was only somewhat important.

Discussion

The survey yielded large amounts of data concerning teachers' beliefs and practices prior to the implementation of the project's interventions, as well as students' perceptions of their classrooms prior to and after implementation of treatments. The results provide a glimpse into what a change agent faces when entering what appear to be typical middle school classrooms.

While the survey used for the intervention project was based on the national survey conducted in 1995, there were modifications to the survey that dealt specifically with the interventions of the feasibility of high-end learning study. This section will compare this project's middle school teachers' responses with the results obtained in the earlier NRC/GT study looking at academic diversity, as well as other interesting and unique findings concerning teachers' classroom practices for the intervention study.

As in the earlier study, "positive" beliefs and practices are considered to be those that (a) reflect an awareness of and sensitivity to differences in students' academic profiles, (b) demonstrate modifications in curriculum and instruction responsive to student differences in readiness, interest, and/or learning profiles, and (3) enhance the likelihood of curriculum and instruction responsive to academically diverse middle school learners (Moon et al., 1995).

Conversely, beliefs and practices are considered negative if they (1) reflect lack of awareness of or sensitivity to differences in students' academic profiles, (2) are indicative of one-size-fits-all instruction in which most/all students are expected to complete the same learning tasks, presented in the same way, and over the same time span, and (3) diminish the likelihood of curriculum and instruction responsive to academically diverse middle school learners (Moon et al., 1995).

Comparison With the 1995 Study Findings

There appear to be several areas in which the current study's findings replicate what was previously found in the 1995 NRC/GT study. Consistent with the 1995 study findings, teachers report that learning contracts, tiered assignments, advance organizers, computer programs focusing on basic skills or advanced understanding, curriculum compacting, learning centers, flexible grouping, or interest centers are rarely used in their middle school classrooms. Teachers in the current study also indicate that these options are not used with either advanced learners or struggling learners.

In contrast to the 1995 study findings, state curriculum standards, local curriculum guides, and key concepts and principals of core disciplines are considered the three most important factors in determining instructional content taught by teachers. Previously, the 1995 study findings indicated state programs as having little influence on the delivery of instructional content. Instead, focusing on complex open-ended questions and student questions and choices were the most important factors in determining content, with state curriculum standards and testing programs regarded as least important. Perhaps the findings of the current study reflect more of the national level initiatives focused on high academic standards and state tests that assess these standards.

In the 1995 study findings, teachers indicated that remedial learners had the most influence on their instructional decision-making, followed by gifted learners, special education learners, and culturally diverse learners. For this study, findings indicate that teachers consider the whole class as a single unit first, followed by average learners, learners with disabilities, gifted learners, and remedial learners, with culturally diverse learners rarely receiving consideration in making instructional decisions.

Unique Findings From the Current Study

Because of the nature of the interventions being implemented, several areas were investigated with participating middle schools that were not considered in the 1995 national study. This section of the report will provide highlights from these unique areas.

The majority of teachers report using example activities and observations to modify the content of activities, types of products required of students, and student grouping arrangements; yet a large portion of teachers also indicate never tailoring an assignment for students or varying materials based on student readiness levels. Instead, lecture and direct instruction to the whole class using the state standards and local curriculum guides is the predominant reported modality of teaching (46% daily; 98% at least weekly).

Teachers also indicate that lack of planning time, concerns about classroom management, and the range of student academic diversity are factors that hinder them in differentiating instruction. Lack of planning time and availability of assessment materials are factors a large portion of teachers considers as hindrances in implementing authentic

assessments. State and district mandates are considered neither hindering nor helpful in differentiating instruction or implementing authentic assessments.

Students' Perceptions of Their Classrooms

In agreement with the teachers' responses, students indicated that more informal methods of pre-assessment (e.g., example activities, observations) rather than formal methods (e.g., pre-tests, individual conferences) were used as common pre-assessment techniques. Students also indicated, consistent with teachers' responses, that the instructional content of their classes was textbook driven and focused on student success for more formal assessments (e.g., end-of-unit tests, standardized tests). Students also indicated whole group instruction supported by note taking and all students working on the same assignment as the predominant format of their classrooms. As one student aptly put it in the larger study when being interviewed about typical days,

> You sit down and everybody is talking to each other until the bell rings. When the bell rings, he [teacher] shuts the door and you have to be quiet. He tells us what we are going to do for the rest of the day or the rest of the period. He gives us, like say, the lesson plan and then he gives us the worksheet and we do that and turn it in. If we are watching a movie it's all quiet and he makes us take notes on the movie and he always puts things up on the overhead and everybody is quiet and we have to copy what is on the overhead down on a sheet of paper. Other than that, it's pretty much the same: worksheets and copying notes. (Student interview, Y3, #3, p. 5)

Conclusions

Although the quantitative data provide only a glimpse into teachers' classrooms, several conclusions seem warranted.

- There appears to be room for improvement in developing teachers' skills in addressing academic diversity in middle school classrooms.
- Teachers make little use of strategies (instructional or structural) that would enable the academic diversity of students to be better addressed.
- The influence of accountability through curriculum standards and testing programs appears to negatively affect teachers' willingness to or ability to acknowledge and address the academic diversity of middle school learners.

The degree that teachers' practices are narrow in scope at the pre-assessment, formative, and summative phases of instruction have a strong hold and are persuasive in the school environment, which may in fact be one of the biggest obstacles in moving teachers toward addressing academic diversity. These data suggest that teachers practice traditional schooling that should be questioned and re-examined prior to them being able to consider an educational innovation, such as differentiation of instruction and/or the use

of differentiated authentic assessments for addressing the varying levels of student academic diversity in the middle school classroom. However, with the current emphasis on student achievement and the endorsement of differentiation in *Turning Points 2000: Educating Adolescents in the 21st Century* (Jackson & Davis, 2000), it is possible that middle schools will begin to make significant curricular modifications to address diversity in the classroom.

CHAPTER 5: Qualitative Results

Profiles of Participating Schools

Greene Middle School: Differentiated Instruction Treatment

Setting

Greene Middle School was a magnet school located in the suburbs of a major eastern city. The school sat in a mixed residential area of newer townhomes and older low- to middle-income single-family homes. Because Greene was a magnet school, most of the students did not live in that neighborhood but traveled by bus to school. For some students this was a long trip, requiring taking one bus to an elementary school and then another to Greene.

From the outside, Greene Middle School looked like a small neighborhood school. However, once inside, the school's actual size became evident. The building itself was old, but had been refurbished with wide, stretching corridors decorated by student weavings, etchings, and paintings. Display cases celebrated student work or contained artifacts significant to the school's culture. Books on the Holocaust were displayed in one case, reminding the student body (20% of which was Jewish at the time of the study) of the cost of prejudice and hatred. The school was attached to the Greene Arts Center, which contained a well-appointed theater and dance space. The school library was fairly new, and both it and the computer labs were well-equipped technologically.

Students

In general, Greene's student population was composed of middle class, suburban children from various ethnic and racial backgrounds, although 10% of the population received free and reduced lunch, and a breakfast program for students was also provided.

The coach at Greene noted that students were friendly and moved calmly through class changes, exuding a spirit of openness, cooperation, and order. The school had a dress code that was taken very seriously by students and teachers. When classes changed, faculty members filled the halls, greeting and responding positively to students, moving everyone along to where they needed to be. Students had designated times to go to their lockers and could not go otherwise. Every teacher had a sign outside of his/her door that told students what to bring to class each day. Students appeared to be happy at Greene, comfortable with the school's emphasis on structure and order (Coach Exit Interview, Y2, #9, p. 5).

Greene prided itself on its performance on state and county tests and on the absence of discipline problems (Conover, 2001). The school's second principal described Greene as having "a very rigorous academic program" (Conover, 2001, p. 14).

The county school district of which Greene was a part set the number of students to be admitted into Greene's sixth grade class. That number tended to increase by a few students each year as parents appealed the school's rejections of their children and won. Students who applied and met the basic criteria for attending Greene were invited for interviews. The majority of the students who were interviewed were then put into a lottery for available positions. Increasing numbers of parent appeals and lawsuits over the years made it increasingly difficult for Greene to eliminate students from the lottery (M. Thompson, Personal Communication, March 2001).

Greene also had criteria in place for accepting a small portion of student applicants without placing them in the lottery—a policy that they termed "acceptance by the prodigy factor." This allowed each magnet school to accept 10% of their incoming students purely on the basis of talent in the magnet area, avoiding the risk of those students failing to win a spot through the lottery process (L. Conover, Personal Communication, March 2001).

Members of the Greene staff told the coach that community perception held that Greene's student population was made up of the most academically talented students of those included in the lottery—essentially, that Greene was populated by the "cream of the crop" coming out of the district's elementary schools (Conover, 2001, p. 4). However, the principal of the school insisted that such a perception was false, and that students were chosen fairly from the lottery. The principal did not mention those students who were automatically accepted to each magnet school without being entered into the lottery. The coach at Greene did note that, during the time of the study, Greene's population appeared to contain a more diverse population, both academically and socio-economically, than outsiders tended to believe (Conover, 2001).

Staff

Staff members were friendly to visitors and to coaches, and seemed to have good working relationships with one another. Younger teachers ate lunch together, using each other as a support network for the formidable stress and pressures that went along with teaching at Greene. Teachers who wished to teach at Greene had to apply to do so; teachers were not automatically transferred from other schools (Conover, 2001).

New teachers at Greene emphasized that they worked hard and, because they taught integrated curriculum (math/science, English/social studies), needed to be comfortable with two disciplines. Generally, teachers came to Greene certified in only one of their assigned areas, acquainting themselves with the second area during their first year of teaching.

> One of the difficulties that seems to surface in conversation frequently is the difficulty in teaching integrated math and science or English and social studies . . . for example, Brian Clark majored in history and has taught history and social studies. Now he must teach English as well. Katie, on the other hand, majored in

> English and told me she had to spend a great deal of time the first year learning social studies content. (Field Notes, Y3, #1, p. 1)

Adding to the difficulty of learning a new discipline while coping with the pressures of being a first year teacher, teacher observations by administrators occurred frequently at Greene and carried a great deal of weight. Teachers prepared their lessons for these observations with a "make or break" attitude, aware that a great deal rested upon their performance (Field Notes, Y3, #2, p. 3). During the 3 years of the study, teacher attrition was extraordinarily high, a powerful testament to the great pressures felt by the faculty.

> Katie Burns was not able to attend the early morning coaching session or interview with me as we had scheduled because she had to arrange for coverage for teachers on her team who were absent. Apparently, as team leader, she must find or provide coverage for those who are absent when no substitutes are available. Katie has been making lesson plans and teaching when she doesn't have her own classes for two teachers who have left for the rest of the year. This must be standard procedure but I am shocked that a second-year teacher must take on coverage for those who are out indefinitely until replacements are hired. I am quite concerned for teachers like Katie who are excellent beginning teachers given so many responsibilities that they can no longer do the job for which they were hired with any degree of excellence or creativity. I would not be surprised if Katie moved onto another school with fewer out-of-class responsibilities. I believe this is what led John Hunt and, perhaps, Michael Ross, to leave Greene. (Field Notes, Y3, #2, p. 4)

Because of the high attrition rate of teachers from Greene and the stress of the job, only two teachers remained with the study over the course of the three years. While some of the initial participants left Greene, other teachers dropped out of the study or simply became inaccessible, literally hiding from coaches. The Greene coach describes a typical visit to Greene:

> I am very disappointed that of the six teachers with whom I am working, only two remembered and attended the coaching session this morning. Jeff Allen and Suzy Lancaster were present. Katie Burns was arranging for coverage, Matisha Frank claims she had no idea I was coming, Lauren Landau was not in school, and Brian Clark was being observed today and asked not to be included on this visit. (Field Notes, Y3, #2, p. 1)

While Greene teachers were generally outwardly friendly to coaches, with a few exceptions, after the first year they were not invested in the study. With many other concerns (learning new content, observation pressures, out-of-class responsibilities) taking precedence, active participation in the study was given low status by the majority of teachers.

> I believe there are teachers who are interested in learning about ways to differentiate and who are willing to try new ideas. I also see teachers who are overburdened by responsibilities who cannot take the time to try something new. Unfortunately, when teachers are pulled in two different directions by school responsibilities and responsibilities to this project, this project loses . . . I feel that [this project] is not nearly as serious a consideration as every other thing that happens at this school. (Field Notes, Y3, #2, p. 5)

The lack of teacher commitment to the study was greatly exacerbated by the shift in school leadership that occurred between years one and two of the study.

Administration

Greene's principal during the first year of the study, Gina Parks, was a fair but no-nonsense leader, innovative and well-liked by the faculty. Parks was committed to and enthusiastic about differentiation, recruiting specific teachers and actively encouraging their participation in the study (Coach's Reflective Notes, March 2001). During year two of the study, Parks left Greene for a central administration promotion and was replaced by Linda Walker. Walker had a smooth demeanor and a distinctly professional air; her major concerns were about students, parents, and her job. The staff regarded her with a mixture of respect and wariness. Some teachers felt she said what she thought they wanted to hear, but did not act on their behalf (Field Notes, Y3, #2, p. 1).

Walker's dedication to the study did not appear to be as firm as Parks' had been. She professed great interest and support for differentiation in her school, but did little to encourage her teachers to participate in the study (Field Notes, Y3, #3, p. 2). The coach noted that "I am frustrated by the principal's 'lip service' to our project, feeling that she expresses great interest and support and then fails to carry through to make sure I have the information I need to conduct testing, in-services, and coaching sessions" (Field Notes, Y3, #3, p. 2). She rarely returned phone calls or provided needed information to the coach, complicating the coach's already difficult task of locating and meeting with overloaded teachers. The coach often came to Greene only to find that no teachers were available to meet with her. She felt that it was quite evident that she was alone in trying to motivate teachers to participate. Eventually, an assistant principal took up the slack, helping with scheduling and study-related testing. While the assistant principal was efficient, she seemed put-off by having to deal with the study. The coach felt that the administration did not consider differentiation a high priority. The coach perceived that the administrator's values were communicated to the teachers and affected their participation (Field Notes, Y3, #3, p. 11). Because of the lack of emphasis placed on the study by the administration, the coach noted that "teachers seem to have little regard for this project" (Field Notes, Y3, #3, p. 11).

Insight From Greene: The Need for On-site Coaching

The coach assigned to Greene was ardent about and dedicated to her role in the study. She deeply believed in the necessity of differentiating to meet different students'

needs and took her role as a coach very seriously. She desperately wished to see similar commitment from participating teachers (Field Notes, Y3, #3, p. 1). However, during her time at Greene, she became discouraged by the school's general inability to commit in any sustained and deep way to either differentiation or the study itself. Only two teachers remained with the study for its duration, and only one regularly came to meetings and prepared differentiated lessons. (Notably, and not surprisingly, this participant became the teacher who, of all of the teachers in the entire study, most accurately and consistently used differentiation in his classroom. See profile of Jeff Allen.) Because of the high-pressure environment of Greene, teachers had to attend to the pressures that were most immediate and visible, pressures such as observations, covering for other teachers, preparing students for testing, and the need to plan for their classes (Field Notes, Y3, #3, p. 2). For the large majority of Greene teachers, the study was not one of those pressures.

> There seem to be so many circumstances that capture teachers' attentions and make this project seem least important. For example, on Oct. 5, parent conferences were to be held in the evening. Teachers were feeling pressured to be prepared for the day and also stay until 8:00 or 9:00 in the evening. Teachers did not know I would be observing today, and no classes were using differentiated lessons. This is telling in itself. We have not made sufficient progress with any of our teachers to see differentiation as the rule rather than the exception. (Field Notes, Y3, #3, p. 3)

Making large-scale changes in teaching practices in this school required more intense one-on-one interaction than was possible in the coach's once-a-month visits. Based on her "frustrating" experiences at Greene (Field Notes, Y3, #3, p. 1), the coach noted that,

> If we truly want changes to be made, we need to visit as coaches more often than once a month. Perhaps we could visit two-three times per month in the first year of coaching and then reduce visitations as the project goes on. Teachers seem to try to do the minimum I've asked, but I have a very strong sense that when I leave, they put this aside until it's time for me to show up again. (Field Notes, Y3, #3, pp. 11-12)

Teachers who wanted to try new things and change their thinking were stymied when the coach had to leave and day-to-day concerns took over. Because of the off-site nature of the coaching, it was difficult for the coach to encourage teachers to complete journals or schedule time to get teachers together to discuss strategies, successes, and concerns. The coach could not be an integral part of the school, nor could she spend the time required for significant improvements. A coach whose presence was felt every day and who was an integral part of the school may have affected more wide-scale changes. The coach's experience at Greene illustrates that the importance of on-site coaching in supporting teachers as they undertake changes in their practices cannot be overemphasized.

A Greene Teacher

Jeff Allen. Jeff Allen's classroom continually buzzed with the sounds of busy, engaged, and happy students. His classroom management skills were exceptional in that he needed little other than interesting, hands-on activities to maintain order in the classroom. Additionally, Allen had strong command of and love for his content, both in math and science, and he made concerted efforts to stay current in both subject areas (Conover, 2001, p. 22). His many years of teaching experience had taught him that he was most effective when well-prepared and organized, characteristics evident in the smooth running of his classroom. Allen had a strong sense of what students needed and he cared deeply for the students, routinely adjusting his materials and activities to meet their needs. Allen was particularly concerned about providing appropriate challenge to all students and keeping all students interested. He was very concerned about being a good teacher—as he defined it. He was not very concerned about the highly-weighted teacher evaluations; he judged his success by the reactions of his students. Allen clearly set his own goals for success and followed his own rules, a theme that emerged from his stories about his years of teaching. While teaching at another school, Allen and his colleagues were told by the administration that they were expected to fully implement cooperative learning in their classroom. Allen felt that students needed to receive information first from the teacher and then process it in groups, and so he ignored the mandate, despite his knowledge that it could "get me fired" (Teacher Interview, Y3, #4, p. 5). Additionally, Allen made it clear that he generally ignored the county's prescribed curriculum, as he felt it did not match the way students learned.

Allen's beliefs about teaching were quite traditional. He felt strongly that, before students could make sense of material, they needed for it to be "explained" by the teacher. Independent and small group work were useful for students to further explore the ideas presented by the teacher, but he did not believe that discovery learning was effective (Teacher Interview, Y3, #4, p. 4). At the same time, Allen was open to innovative ideas that fit in with his prior beliefs, continually seeking to improve and change his teaching:

> I'm never comfortable. That's the good and bad of teaching. You are never really comfortable. It's like I'm wondering in science why do I do more of the independent choice type of activities where . . . . I differentiate the requirements, like with organizers, and then I don't do that in math? And, why don't I give more tiered assignments in science? It's constantly running through my mind . . . so I never get comfortable with it all. (Conover, 2001, p. 23)

Allen even expressed disappointment at how Greene had lost its reputation for innovation since the departure of principal Parks. Clearly, Allen was largely traditional in his practices because he believed these practices to be true, not because he was unwilling or unable to try new ideas. "Even though he had been teaching for over 20 years, and knew he would retire at the end of the 1999-2000 school year, he still wanted to learn how to do a better job of instructing students and meeting their needs" (Conover, 2001, p. 23).

Allen became involved in the study because he had been asked specifically by Parks to participate (Conover, 2001, p. 20). Allen agreed out of respect for her, but was initially reluctant to try out the strategies presented to him. He indicated that he was worried that he could not take on differentiation and still keep up with what he already did. However, as Allen believed from the outset that students vary in their learning needs, he soon became intrigued by the ideas presented by differentiation. He began to open up to the coach's suggestions and feedback, and was the only teacher who regularly attended scheduled meetings, prepared differentiated lessons for observations, and took the idea of differentiation seriously. The coach said of Allen, "He approached differentiation of instruction with an eagerness to learn and did not, as more experienced teachers sometimes do, take an 'It will never work here' attitude toward suggested ideas" (Conover, 2001, p. 23).

By the end of his third year of participation in the study, Allen had mastered tiered assignments, the primary strategy on which he had been focusing during this time. The coach who worked with him felt that Allen's primary interest in the differentiation study was learning to create tiered assignments and, beyond that, did not believe that he would progress much farther with differentiation. The coach realized that, while Allen was always trying to improve and change his teaching, Allen had a strong sense of what worked for him and what did not. For Allen, tiered assignments were a sufficient method for reaching different students in different ways.

More clearly than most of the other teachers in the study, Allen recognized the need to challenge advanced students. He expressed strong feelings of guilt for times when he could not do so, and quickly adjusted the next day's lesson to add challenge for the students he thought he had cheated the day before. Allen's commitment to challenging students was most evident in the third year of the study. In the middle of the year, the eighth grade math/science teacher left the school with little notice. With only a few days' notice, Allen was switched from sixth grade math/science to fill the spot she had left. When faced with an eighth grade Algebra II class, a course he had not taught in seven years, Allen felt unsure of the content. He knew he could not adequately challenge the students in that classroom, and his dismay was evident. He spoke frequently of the disappointment he could see reflected in the students' eyes and set about quickly to obtain the depth of knowledge he would need to provide appropriate challenge. Allen's true colors showed through during this experience: he faced the situation analytically, sizing up the situation and making immediate, necessary adjustments. He "crammed" and created challenging tasks for the advanced students, using tiered assignments as a way to do so (Allen Interview, Y3, #6, pp. 5-6).

The change in teaching assignment was difficult for Allen, as he felt it necessary to establish a set of behavioral expectations for his students prior to delving into instruction. The previous teacher had set no behavioral expectations for the students and as a result, they were, in Allen's view, "terrible" (Allen Interview, Y3, #6, p. 7). Allen said he had to focus for at least 2 weeks on reinstating appropriate classroom behaviors and establishing a classroom atmosphere in which students were in control and responsive to him before adding any additional elements. Once he did establish order in

the classroom, however, the students were engaged by and satisfied with their new teacher (Observation, Y3, #7, p. 4).

Franklin Middle School: Differentiated Instruction Treatment

Setting

Franklin Middle School was a large middle school in an urban southwestern city, located in a state that highly valued standardized test scores. The school, considered one of the district's better middle schools according to their teachers, was proud to boast acceptable test scores, and the principal and teachers felt the school was primarily focused on instruction. The school housed students from many cultures, most notably Hispanic students, many of whom possessed a strong command of English. Considered a large middle school by the district's standards, Franklin served approximately 1,200 students in grades 6 through 8. Roughly 35% of the students were Hispanic, 20% were African American, and 45% were Caucasian. The aging school building was situated close to a well-respected private college and the neighborhood reflected the aging wealth that once populated the older brick homes. The school's student and teacher populations were considered solidly middle class and notably stable.

The climate was focused on school safety and acceptable student behavior. The dress code was strictly enforced, which meant no shirttails untucked or large jackets worn inside the building without rapid teacher intervention. Despite the emphasis on behavior management, the environment was generally perceived as warm and inviting. Halls were orderly as students changed classes. Within classes, order prevailed, sometimes reflecting a tone of resignation or apathy from students.

There was a great deal of parent involvement in the school, which distinguished Franklin from many other middle schools in the district. The parent involvement, seen as a mixed blessing by some teachers, ranged from assistance with early morning clubs and activities to active involvement in the PTA. Some parents used this involvement as a strategy to secure the best teachers for their child or to remain current with the latest gossip. Despite the occasional parent distraction, most parents, teachers, and students seemed to enjoy the climate of the school and felt it was a good place to work and learn. Juan, an eighth grade student offered, "you are welcome here, this is a good school, and it's fun at this school" (Student Interview, Y2, #3, p. 1). The school was overcrowded; core classes held 30-40 students per class period, requiring students to sit in every available desk and chair, with others forced to sit on the lab tables in the back of the room and at the teacher's desk. (During the third year of the study, the school had four trailers in the back of the school property, and the following year the sixth grade was moved out of the school to make more room for the increased enrollment in the other two grades.)

Principal

The principal, Rita Shepard, a slim and petite middle-aged woman, communicated a "no nonsense" affect. When asked, Ms. Shepard proclaimed a higher value in her role

of instructional leader than that of administrator or manager, but interestingly, seemed to remain at arms' length with instruction and allowed her teachers to make independent instructional decisions. The teachers and coach did not recognize her as a leader so much as an effective manager of administrative details and student behavior. She often attended to the personal needs and issues of individual staff members rather than the overall organization, politics, or instructional program at Franklin. She weighed the effects of this study in terms of observable attributes, such as the way teachers at Franklin talked about differentiation.

In the first year of the study, professional development sessions were conducted on several Saturdays throughout the year, a central office decision that resulted in frustration and anger from participating teachers. The sixth grade target team from year one rescinded their participation in the study in response to the high demands of the study, including the participation in professional development. The general feelings from the staff were that of displeasure with the project, feeling overwhelmed at the prospect of change introduced in a way they perceived as disorganized, and not regarding the great teaching they believed they already incorporated. A researcher in the first year reflected in her field notes about the staff perceptions. "The sentiment was that differentiation should be reintroduced—that ill-will, frustration, distress, and local communication breakdowns over-impeded their ability to concentrate and learn this year" (Field Notes, Y1, #1, p. 1).

In the second year of the study, Ms. Shepard reconfigured the professional development sessions. Project directors placed coach Dr. Amy Parker to work more consistently with teachers in shorter, more frequent, after-school meetings. Additionally, Shepard arranged for the creative use of teacher workdays and half-day sessions with rotating substitutes. Still, participating teachers groused about the limited planning time built into the schedule being inadequate for the increased planning required with differentiated instruction. In the third year, Ms. Shepard increased the support for teachers participating in the study. She recognized the validity of their concerns and provided critical planning time to teachers during the day, several times during the year.

> Whatever it takes, I have to give them time to plan and it has to be during our time, the school time, when they're working. They're too worked out on the weekends, after school, before school. That is just not a good time . . . . We did invest money in them and did bring in subs so the teachers could sit down and have planning time as much as they needed and we just kind of bit the bullet and took it out of our budget. And I think that has helped a whole lot. (Shepard Interview, Y3, #1, p. 12)

Participating teachers felt supported; Ms. Shepard heard their concerns and provided them with the precious planning time they requested. A seventh grade science teacher, Jennifer Snowe, discussed the value of planning time.

> We have been very supported by our administrators. Ms. Shepard has allowed planning time and monies and she has allowed us time which I know is not easy

> to do. Because we have so much to do as teachers . . . and we had to get special times off for prep days instead of going to, like, district-wide professional development, we got to go spend the day with Amy [study coach] and have a professional development day with her. We got to have a day to plan. Things like that are really important. Planning time is of the utmost importance. If you don't have time to plan, then you aren't going to have time to implement. Making the plans, laying out the legwork . . . you can't just decide you are going to differentiate one day. It is a step-by-step process. (Snowe Interview, Y3, #7, pp. 12-13)

A researcher at the site also posited that these accommodations might have occurred to increase teacher buy-in of the project, to placate central office staff concerned about teachers withdrawing from the project, and to show visible support for the project that she touted heavily to parents. The action, however, did result in some negative responses at Franklin. The scarce resource of planning time was allocated strictly to teachers participating in the project, creating a clear division—and some resentment—between the teachers "in" and "out." An observer to Franklin during year three noted that the teachers participating in the project assumed a group identity, had distinct language and shared experiences, and with the help of their coach, viewed the project as an avenue for professional growth (Field Notes, Y3, #2, p. 2).

> I had the chance to be at the project faculty meeting on Thursday afternoon and hear the interaction. This project group has a group identity and is valued by the teachers as a real avenue for professional growth. (Field Notes, Y3, #2, p. 2)

Coaching Teachers at Franklin

Dr. Amy Parker, the high-energy observer/coach at Franklin would not take no for an answer. From the moment she started visiting the middle school in the project's second year, she became a solid member of the school family and a close ally to the project teachers. Ms. Shepard let Dr. Parker have total control of the teachers' professional development, and Shepard stayed uninvolved in the process most of the time. Coaching for some teachers meant handholding and co-planning, for others it meant suggesting the next step in the journey towards a more differentiated classroom, for many it meant exchanging personal details from each other's lives, developing a sense of trust and camaraderie. For the most part, the teachers greatly appreciated Dr. Parker's work, and many continued to invite her back to visit their classrooms. Her cheerleader-like encouragement and affirmation for teachers' risk-taking put many anxious educators at ease. A researcher noted in the third year about the relationship between the coach and the staff,

> I am impressed by the relationship between Amy and the teachers with whom she has been working—as well as many of the other faculty members. They not only enjoy each other socially, but they discuss lesson plans and differentiating naturally around the lunch table. (Field Notes, Y3, #2, pp. 1-2)

After persistent cajoling, coaxing, and coaching on the part of Dr. Parker, Ralph Boxer, one of the teachers identified by the principal as least effective, tried to incorporate tiered assignments within his classroom. He admitted that he was a resister in the first year of the project, but with the help and personal attention from Dr. Parker, he decided to try again.

> Well, the first year, I only tried it one time . . . well, I tried it twice. One time was a miserable failure . . . I think I planned too little or planned too much, and it didn't come out the way I wanted it to, so, I thought it was a failure. I was discouraged a little bit at the beginning. Honestly, I had a kind of negative attitude toward some of the things that we were doing and what we were learning. The next year, I said 'okay I'll try it again' and that is when Amy came in and we started talking over some things. We met more one-on-one and she gave me some ideas. Instead of those meetings being told all these things we [have to do] . . . transparencies and packets . . . we worked through them, then we began to apply them to our subject matter and I started to get it and I planned something that went really well. (Boxer Interview, Y3, #4, p. 11)

While the attempt was a good beginning, his interpretation of the strategy was somewhat misguided. His tiered assignments were different worksheets with different questions, but each required the same low-level types of responses, and were printed on different colored copy paper. Dr. Parker, joyous at the previously intransigent teacher's attempt to change, proclaimed his work a positive example of differentiation. In fact, Dr. Parker unconditionally supported all teachers' efforts, perhaps realizing but never articulating a difference between positive efforts and effective differentiation. The safe atmosphere Dr. Parker fostered supported teachers' continued risk taking efforts. Teachers continued to collaborate with Dr. Parker throughout the project and maintained positive feelings about their growth despite the wide interpretation of differentiation in actual practice.

Three Teachers' Journeys

Ralph Boxer. Ralph Boxer resembled a 30-year-old, redheaded linebacker: over 6 feet tall and 200 pounds, his actual role was that of middle school social studies teacher and football coach. He was passionate about his subject area, state history, and relished interesting details about events, people, and historical time periods. While he clearly knew his subject matter, he was ineffective at managing student behavior in the classroom. Observers heard his voice shouting while in other nearby classrooms and when traveling through the hallways. The tone was described as gruff more than mean, more in line with summoning groups of football players into a huddle than redirecting students in a classroom. Students saw through the gruff exterior and described Mr. Boxer as a "nice guy" (Observation, Y3, #2, p. 8). His classroom environment was sterile and somewhat disorderly, books aimed at the bookshelves with some nearby on the floor, and no bulletin boards or posters adorned the walls. Despite his lack of classroom control, he was a persistent risk-taker. Dr. Parker noted in an observation during the third year of the study that he started to vary instructional strategies, moving beyond direct instruction to

include some student grouping for cooperative tasks. "While the management issues are going to continue to need attention, I see a movement away from standing in front of the class and discussing the text" (Observation, Y3, #2, p. 4). He was the first teacher at the school to attempt a tiered assignment, he willingly attended all workshop sessions, and he thoughtfully completed his teacher journal throughout the project. He was very self-critical and didn't view himself as a master teacher, despite his constant attempts to differentiate in his classroom. He believed he made some progress as a result of the project, but believed his greatest challenge was to figure out a way to engineer multiple activities and maintain control in the classroom, likely an accurate diagnosis given the general disarray that typified the class even during whole-class activities. The principal recognized his efforts to incorporate differentiation, yet knew that his classroom management issues prevented him from being ultimately effective. "I observed him in the first year. I thought, 'am I going to be able to keep Ralph here or not? We're going to have to work.' After Dr. Parker started working with him . . . I mean, he has blossomed" (Shepard Interview, Y3, #1, p. 7). Dr. Parker believed he wanted to do well, and enjoyed coaching him to improve.

Jennifer Snowe. Jennifer Snowe was a tall, slim young woman in her late twenties who began the project with 2 years teaching experience. Her upbeat attitude and youthful appearance made her popular with her seventh grade students. Despite her novice status, she was adept at managing student behavior and multiple classroom activities. She had a great deal of frenetic energy and this frenzy influenced her teaching style and ability to wait through silence for students' responses. An observer noted an example of her impatience with silence:

> She ended the class by asking the question, "what is something you noticed about the earthworm that was different from the frog?" While students were thinking, she pushed on and said, "how about the heart." (Observation, Y3, #2, p. 5)

Snowe recognized this pacing issue as an area for her future growth. "I have a tendency to not give enough time and I need to give them more time. But I feel like I never have enough time so that's like, partly not my fault" (Snowe Interview, Y3, #7, p. 7). Her high energy in the classroom fueled her rapid pace, at the expense of opportunities for extended student thinking and reflection. This practice was aligned with her perception of the optimum conditions for adolescent learning. She saw the role of the teacher to be an entertainer; disguising challenging learning with fast paced, high interest activities.

> I try to make things as interesting as possible for them. I try to never be boring. It's a "zapper" generation for these kids. They have a hundred channels at the flick of a hand when they get home and if I'm not entertaining to them, then forget it, they are going to tune me out and my class is going to be boring. So I try to be challenging and entertaining. (Snowe Interview, Y3, #8, p. 5)

Ms. Snowe explained that she taught the way she liked to be taught. She giggled as she revealed that she was a hyperactive child who needed to be entertained in school in order to pay attention. She further explained that, as a student, she liked her science

classes the most because she enjoyed the labs and other hands-on activities, which became a large part of her own instructional program.

> My best science teachers and the reason I am so interested in [science], the reason I was a biology major in college is because I had such good labs. They were so interesting. I was a hyperactive kid. I needed to be entertained too. I know what that is like. So, I have a tendency to remember that feeling. I am still like that. Plus, I, like . . . this sounds kind of selfish, but I like to entertain myself, too. I don't want to pull the same lessons and say, "oh I will do this today." I have to be entertained and it entertains me to do that. (Snowe Interview, Y3, #7, pp. 10-11)

Ms. Snowe gathered curricular materials from various sources: her textbook, teacher resource guides and kits that accompanied the textbook, and teacher resource guides from other grade levels. She explained how she selected materials, placing more emphasis on activities that looked engaging to students than activities that were deep and rich in quality.

> But the book itself doesn't have any labs with it. It's not very hands-on science and I believe at this age that the hands on stuff is the most important thing, to get these children interested . . . [The eighth grade book is] wonderful. It has all these great activities and great cute labs that are very simple, but you can extend them and make them more applicable to critical thinking skills and you really can work with them and make them completely different. That is a great curriculum! (Snowe Interview, Y3, #7, p. 6)

Her motivation to seek student engagement was also evident in her constant variation of activities, instructional strategies, and frequent use of student groupings for class assignments.

> Oh yes, we started grouping day one of school. We wrote down the benefits of groups. We made up a rulebook. Each group makes up a rulebook. Then we posted rules all over and we talked about . . . we had been grouping day one because in science you always have to work in groups because you have to share supplies and cooperative learning is really good with differentiation. Peer learning is really good with differentiation . . . (Snowe Interview, Y3, #7, pp. 2-3)

Her characteristically quick and eager path through learning experiences translated into her own rapid digestion of professional development. Perhaps in this haste, Jennifer misunderstood the differences between differentiation and grouping. She believed that differentiation required students to work in cooperative groups at all times. Further, not wanting students to feel singled out, or to sense any hierarchy between the groups, she refrained from using any group labels that connoted any differences in levels, and seemed to predominantly arrange heterogeneous groupings of students.

> [The groups] are purposely mixed [ability]. "Group A" is a certain level that is completely different than "Group 1" and "Group Green." Sometimes it is three

> different groups and they are all, that whole group is pretty much on the same level. (Snowe Interview, Y3, #7, p. 3)

Dr. Parker enjoyed Jennifer's positive attitude and upbeat energy and was pleased by how actively she participated in workshops. It was clear that Jennifer picked up some of the language she heard, but she revealed her shallow understanding about vocabulary, such as metacognition, and basic principles of differentiated instruction, never realizing that differentiated instruction is more accurately described as instructional philosophy than any one particular instructional strategy. She believed that differentiation in action translated into tiered assignments, and that students benefited most when they chose the tasks they worked on in class.

> The chief benefit [of differentiation] is . . . I feel, that students have more involvement and more decisions in what they learn and how they learn it. I feel they have more say so in their metacognition, if you will. Therefore, they reap a lot more benefit because they feel as though they had a say so. (Snowe Interview, Y3, #7, p. 3)

Although she majored in biology, she did not discuss her subject matter at great length, and it was uncertain how proficient she was in the discipline. The activities she planned for her students were mostly the same for all students in all the groups, and task success mostly required following directions from lab instruction sheets. Additionally, while she described her class activities as mostly hands-on, group-related tasks, students described a different type of experience. James, an identified gifted student, responded to the interviewer's request to "take me through Ms. Snowe's class. If I were to visit her class, what would the room look like, what are the students doing, what is the teacher doing?"

> [We do group activities] often, but not as often as we did in sixth grade. The room is very big and clean most of the time. The students don't act up much in her room at all because she is a very strict teacher and she always teaches us something new everyday. It's not like we stick on one thing the whole week, that is, on labs, but not on like . . . we most of the time do paperwork and she has a journal question for us every morning that we come in and we are supposed to do that. It's like a section [of the textbook] review and you do questions on the section. We discuss the questions and the answers and we move on to our main part of class . . . learning worksheets, things like that. She tells us what we are going to do during the day. We do either labs, but most of the time we do worksheets. . . . Sometimes [Ms. Snowe] is grading worksheets that we've turned in before. Sometimes she is getting ready for the next lesson. Sometimes she will interrupt us during the worksheet and talk to us about it and tell us like how to do it. (Student Interview, Y3, #3, pp. 3-4)

The observer echoed the frequent use of textbook readings followed by written answers to the questions, such as James described.

> Jennifer's class was amazingly quiet and working on a task when they entered the room. I asked her later what it was that they were working on exactly. She said that she doesn't have time to go over all the details that are presented in the chapters of the text so she requires students to complete the section reviews as one of the procedures that students do everyday. She uses this procedure like an anchoring activity but she said that she also uses journal questions and she has a tri-board of some think-grams that students can do—fun thinking activities. I looked up in the text the section review that they did today.
>
> 1. What is the name for the production of proteins in the cytoplasm of a cell?
> 2. What is RNA? How is RNA different from DNA?
> 3. What are amino acids? How many amino acids are there?
>
> Additionally, she told me that the students know that the section reviews are due at a particular time and a grade is taken for the work. (Observation, Y3, #1, pp. 1-2)

Based on observer's reports, it appeared that Ms. Snowe began each class with at least 20 minutes of textbook work, and each set of questions, like the ones listed above, required simple recall of facts and definitions with limited, if any, critical thinking. Following this predictable opening to each class period, she would group students to complete labs or to collaborate on worksheet tasks.

Ms. Snowe perceived that she grew and developed through her involvement with the project, but recognized that she still had room to grow to improve her practices.

Claudia Eppard. Claudia Eppard, a tall, attractive, well-dressed woman in her late forties, was a skilled teacher, able to speak intelligently about differentiation and the specific models and strategies that she incorporated into her classroom. She sounded confident in her manner, almost arrogant, yet she recognized and articulated the room she still had to go to fully implement differentiated instruction in her seventh- and eighth grade English classes. She was dramatic in the classroom, starting her class with engaging brainteasers and problems that hooked her adolescent learners immediately. An observer recalled a particular lesson where Ms. Eppard started the class with a short story. A senator, she explained, was preparing to deliver a speech, and went to a room offstage to prepare. After only a few moments of the spontaneous tale, Eppard posed a question to the students about whether they believed the senator was nervous, based on what they knew so far. The students recognized that they did not have enough information to determine the answer, and asked yes/no questions in an attempt to determine more details surrounding this mysterious character.

The observer was impressed by the brief introduction to the lesson, noting students' heightened engagement in trying to solve the mystery. Eppard cleverly turned from the tale of the senator to the day's literature assignment (*The Confession*), and the day's objective (students will investigate the ways an author reveals characters to the reader) before students realized the transition.

For Ms. Eppard, teaching was a second career, and she believed she was drawn to the job because of her love of literature. At the time of the study, in her mid-forties, she had been teaching for approximately 12 years. She had a strong command of her subject area, saw obvious interconnections between the many aspects of English literature, writing, and grammar, and saw how standards could be incorporated into sensible teaching without use of test-preparation workbooks. In addition to evident knowledge of her content, she seemed to be equally skilled with pedagogy. Her teaching began in an elementary setting where she developed her repertoire of instructional strategies and classroom management procedures. She interacted comfortably and respectfully with children, and anticipated diversity in her learners' knowledge levels, attitudes, and experiences. She seemed at ease with simultaneous activities, purposeful classroom noise, and flexible student groupings. Ms. Eppard believed that differentiation was something she incorporated and had been doing since she began teaching. She believed the project allowed her to refine existing skills more than develop new ones.

While she believed she had been using differentiated instruction since the beginning of her teaching career, it was evident that she changed her instructional routines because of project involvement. Her planning strategies seemed focused around a concept that organized her lesson and served as a framework for her differentiation. The concepts she incorporated were more topical than global on the continuum (e.g., "choices"), but allowed some differentiation to occur in her classroom housed under that idea. The year after the study ended, Claudia resigned from her job at Franklin and assumed a position at the district's central office becoming responsible for disseminating differentiated instruction to other middle schools in the district. Ms. Shepard explained how Eppard's transition to a central office position would benefit others beyond Franklin.

> She'll be doing things like this, not just for this school, but for all the middle schools so she's going to a position to spread it on and that's kind of what you see happening when people are that good because you don't want to just keep them there. This differentiation is so good, other schools need to do it, and Claudia and I can take it out. (Shepard Interview, Y3, #1, p. 6)

Howard Middle School: Differentiated Instruction Treatment

Setting

Howard Middle School was located in a middle class neighborhood in a small, southeastern city. While the school drew its students from a largely middle class population, it also served highly affluent students and students who were on free and reduced lunch and/or lived in federal housing projects. Howard had a reputation for excellence, so much so that other schools in the district once pegged Howard as "stuck-up." In the years immediately preceding and during the study, as students from other area middle schools were temporarily housed at Howard during school repairs, people began to view Howard as more inclusive. Between 1991 and 1999, in what Howard's principal called "the migration," Howard housed approximately 150 students from outside its enrollment area while their schools were being renovated. Most of these students came

from areas less economically affluent than those served by Howard and lagged behind Howard students academically. Prior to the "migration," 95% of Howard students passed the state tests. During the "migration," the passing rate dropped to 80% (Reynolds, 1999).

In general, Howard had a strong commitment to the development of a community atmosphere, both within and beyond its walls. Seven members of the local community, including the local pastor, his wife, and a retired school teacher, volunteered in sixth grade every Friday to work with students at-risk for failing the state tests. Faculty and staff made a concerted effort to make study coaches feel welcome and accepted at Howard: "that is something I have noticed about the community at Howard. It embraces new people wholeheartedly and continues to nurture the alliance" (Field Notes, Y1, #1, p. 1). During a visit, another Howard coach noted, "as usual, the teachers were cooperative and friendly, even though we interrupted their instructional time for three days" (Field Notes, Y3, #1, p. 1). The warmth with which visitors were received mirrored the general atmosphere of collegiality that marked the relationships between members of the Howard community. There was a great deal of camaraderie and community spirit among the staff. The librarian noted, "We genuinely like each other around here" (Field Notes, Y3, #1, p. 1). Teachers were proud of their school, referring to it as a top-notch place with a good reputation in the district (Dolan Interview, Y2, #5, p. 12) and seemed eager to keep their positions at Howard. As a result, very few teachers moved out of Howard during the 3 years of the study. Throughout the study, Howard remained a very stable environment in terms of the consistency of its staff, students, and administration.

Academic diversity at Howard was dealt with through placing students on one of four teams according to ability levels. Test scores and teacher and parent recommendations determined student placements in one of two "honors" teams, a grade-level team, or a below grade-level team. The sixth grade "below grade-level" team was housed in the basement annex of the school. This corner of the basement was framed by sets of doors and halls that isolated it from other portions of the school. An assistant principal's office was located in this team's space. While he was not highly visible, his presence indicated the school's acute awareness of the discipline issues among the students located in this isolated wing of the school. In 1998-1999, this team was comprised of 92 students, 57 of whom were African American and 33 of whom were White. The students in this team were identified as either having learning disabilities or scoring in the 40th percentile or below on standardized testing. One of the teams designated as "honors" or "advanced" contained 66 students, 3 of whom were Asian, 10 of whom were black, and 53 of whom were White. Only 3% of the students in this team lived in the federal housing projects and only 10 students received free or reduced lunch. While the below grade-level team had 35 discipline referrals for the fall semester of 1998, the honors team had only five. The atmosphere in the below grade-level classrooms was volatile and nervous; the classes always seemed, even under the watchful eye of a very experienced teacher, on the verge of chaos. A large percentage of the students on this team were students who came to Howard as part of the "migration" (Reynolds, 1999).

The Howard coach noted the very different atmospheres in the high ability and below grade-level sixth grade teams:

> What particularly struck me during this visit is the contrast between student behavior in the highest ability grouping of sixth graders and the lowest ability grouping. Margaret, teaching in the low group, is continuously working with discipline issues. Already this year, she is busy trying to resolve a boiling issue among eight girls . . . in contrast, the upper ability students did not exhibit such troubling behavior. In fact, I observed a stark contrast. On one team, a student stopped me to compliment my tie and on the other team I observed a student stop to pick up a water bottle dropped by a peer. (Field Notes, Y3, #1, pp. 1-2)

In general, the community of Howard was open and welcoming to those who visited, as reflected in its willingness to accept students and faculty from other schools into its halls for long periods of time. However, the placement of many of the "migrant" students in an isolated wing of the school revealed the paradoxical nature of Howard's attitude toward outside influences. While community members appeared on the surface to be cooperative and eager to adapt to new challenges, on a deeper level, the status quo was profoundly entrenched. Both the principal and the teachers involved in the study noted that during the years of visiting teachers and students, Howard's environment was strained. The principal remarked that integrating people from "a different type of learning culture" presented "a real challenge to mesh and mold a school the way it needs to be meshed and molded" (Reynolds, 1999, p. 108).

Principal

The school's principal, Eric Waters, was a primary reason for the positive energy that Howard exuded. He was deeply respected and trusted by the faculty.

> With almost watery eyes and a warm tone, Richard, the assistant principal, asked if I had noticed the positive nature of Waters' presentation and the manner in which he encouraged the faculty. Richard then said that he had worked under six different principals. He named a few . . . one who is known as a leading administrator in the district. He said that of all of these, Waters was the best. Richard continued saying that when he was at another school in the district, he had fallen into the slump of the faculty. He thought then, why should he try because the faculty would never care . . . the environment caused him not to do his best. If he didn't feel well, he would just take the day at home. However, in the team spirit of Howard, his attitude was different. He wanted to be at work, even when he wasn't feeling his best, because he did not want to let Waters down. That attitude represents collegiality, commitment, and trust. (Field Notes, Y3, #6, p. 2)

In turn, Waters deeply respected and trusted the faculty, a fact apparent in his willingness to allow them freedom to experiment with teaching techniques in their classrooms and to allow them autonomy within their teams. He thought of and referred to the staff as

professionals. He continually encouraged his staff to take risks and to try new things. At one faculty meeting, he told them, "An effective teacher is one who never stops learning" (Field Notes, Y3, #6, p. 1). He expected and encouraged his staff to broaden their professional knowledge at every opportunity and provided teachers with genuine emotional support as they did so. Waters was devoted to building the faculty's morale, something he accomplished by being continually positive and standing behind their decisions. As a result, faculty morale was generally high. One teacher noted that the best thing about Howard was,

> . . . the commitment by the staff. I am so amazed to see staff members and the administration as well so supportive. But I see that commitment to real learning, and it's balanced with, "Where is this student going? I care about him personally. Let's sit down and talk about it." They go the extra mile as far as I can see. We have students who come here from varied areas and levels, academically and socio-economically. I think students read that. They can't help but read it, that you are concerned about them. (O'Leary Interview, Y2, #5, p. 13)

Waters believed his primary role as principal was to provide his teachers with support. Waters both attended and participated in staff development sessions and provided perks—such as arranging for teachers to receive university credit for their participation—for teachers who attended them. He remained highly hands-off, rarely observing teachers' classrooms or providing feedback on the lessons teachers presented. While he spoke enthusiastically about the importance of differentiating in the classroom and the honor of being part of the study, he made inconsistent efforts to ascertain through classroom visits how effectively or frequently his teachers were implementing their newly acquired skills.

Administrators' Influence on Teacher Participation and Change

Out of all of the study sites, Howard had the largest number of teachers trying differentiation in their classrooms and reaching a reasonable level of proficiency with the strategies they were employing. The willingness of Howard teachers to participate in the study—and their ability to do so—was attributable in large part to the consistent emotional support they received from their principal, Mr. Waters. Waters encouraged his teachers to grow professionally, instilling in his faculty the belief that excellence in teaching requires continual growth. Waters' belief in the importance of professional growth was reflected in his own excitement over participating in the study:

> Waters articulated the importance of what he called "abundance mentality." He explained the idea as providing teachers continuous encouragement and resources for excellence in education. Waters worked toward this goal by lavishing a great deal of private and public praise on his teachers and by continuously obtaining professional development opportunities for the faculty. He said when another middle school in the district turned down the chance to work with the FHEL project, he was excited that his school would have the chance to accept the challenge. In the school's culture of continuous learning, he wanted the teachers

> not to "feel like if they were doing something out of the ordinary, they're gonna be put down by others on the staff or whatever." He wanted to model "that it's accepted to excel and to be excellent and to do the best possible work." (Reynolds, 1999, p. 106)

Waters was aware, too, that his teachers needed his support on their paths toward this growth, encouraging them to set reasonable goals: "We have to be careful to help teachers to understand that they don't have to completely have a revolution in how they teach . . . that they can keep probably the vast majority of their repertoire . . . of their craft" (Waters Interview, Y3, #11, p. 1).

Because modifications in teaching practices were encouraged in Howard's culture, teachers in Howard were initially more ready to "sign on" and "buy in" to the study than at other schools. While in many other schools, coaches and researchers found themselves frustrated by the lack of commitment to the study exhibited by the teacher participants (see profiles of Greene and Rockford), the observers and coaches at Howard were impressed by Howard teachers' enthusiasm for the study:

> People here at Howard are taking on the ideas that you all have presented, promoted, and then not only taking that but finding out what works for us and what doesn't and what works for someone around the corner may not work for me. It's a comfort level that you have to find and it takes a while. If you want to build a quality program with them . . . we need to be accepting of what's out there and learning from it and I see it from this staff. Well, why don't we try this? And bounce ideas off each other. It's a very giving crew. In the past you have some who've shut their doors and, well, if they have an idea it's theirs. You see that and I've been places where it's been like that. But I see a real flow back and forth with this. (Morgan Interview, Y1, #9, p. 2)

Another teacher noted Howard teachers' willingness to try new things:

> And I think here, I'm very fortunate to work with this staff because . . . I think everyone here is very accepting of change or new ideas. And I think they're all, they're professional enough to take it in and say, "Well, I'm gonna try it this way and see if it works for me first. Get my comfort level." I can't picture a situation in here where they're going, "That is not for me, forget it, uh-uh." Which, automatically, so many people do. (Talbot Interview, Y3, #3, p. 11)

Teachers at Howard attributed their comfort with taking the risks in their classroom necessary to experiment with differentiation to the openness of the Howard community: "I do think [differentiation] is a concept you have to be open to in order to make it work for you and some teachers, that's not the way they're used to teaching . . . . We have got a lot of teachers at this school who try different methods so we're all kind of open anyway" (Morgan Interview, Y2, #6, p. 7). Howard's example made it very clear that change is most likely to occur in environments in which administrators think of and treat their faculty members as professionals who are constantly in the process of growing.

This entails trusting teachers and communicating this trust to teachers, giving them the feelings of confidence and security necessary to take risks and fumble while trying out new teaching practices.

The shifting environment at Howard during year three of the study gave another insight into change. During the third year of the study, with the introduction of the state's new high-stakes testing initiative, Howard's carefully constructed calm surface began to come unhinged. While the school generally maintained a positive and supportive exterior atmosphere, a low-level but pervasive uneasiness became evident in the teachers and the principal due to the pressure put on them to perform well on the state tests. One teacher described the feeling of the pressure of the high-stakes testing program as "drowning" (Field Notes, Y3, #10, p. 1). The principal described it as "having the wind knocked out of you" (Waters Interview, Y3, #15, p. 1).

A faculty meeting with the district superintendent concerning how the faculty was to address the standards added to the atmosphere of uncertainty and fear. After the superintendent expressed clear dismay with the faculty's written plan for addressing standards in the classroom, Waters publicly defended his staff, a decision that Waters subsequently felt severely jeopardized his job. Waters described the staff meeting as "the lowest point in his professional career" (Field Notes, Y3, #9, p. 1). The tensions between Waters and the superintendent led to rumors of Eric Waters leaving (which he did at the end of the following year). Additionally, due to the downsizing of the school, teachers were aware that four to five Howard teachers were slated to be moved out of the school—a demoralizing disruption for this close-knit staff. Under the influence of these factors, the feeling of stability so crucial to Howard disintegrated. During a meeting with three Howard teachers, the Howard coach wrote

> Betsy stood up and closed all the doors leading into the room. She explained that what they were saying was very confidential and acted as if she was afraid someone would overhear the comments. Beth commented that, during the meeting with the superintendent, their district leader had offered no affirming words for the current job the teachers were doing. I asked if they felt the faculty was being attacked or Waters. Each of them readily agreed that the faculty was the target. One added that if Waters was attacked, it was an attack on the school. Each teacher expressed her concern about the public humiliation that Waters had experienced . . . Betsy picked up with her thoughts saying she was "beginning to be nervous about everything in the district." She also said that the superintendent didn't realize that the reality of the standards would force the teachers to teach to the test. Furthermore, she feared that the superintendent was reacting in this manner because he wanted to fire people . . . Beth picked up the conversation, saying "as teachers we're slapped in the face" by the media, and that this most recent event with the superintendent was the worst slap because it came "from within the camp. It was friendly fire." Betsy spoke, explaining that from now on she would be saving all the student tests to help document that she had taught the standards and that they had been learned. "I have to prove everything," she said. Then, to emphasize how strictly accountable teachers would be, Besty explained

> that the district was currently rewriting teacher assessment procedures. With a bit of anger, Beth added, "Let them hold me accountable, but pay me what I'm worth." (Field Notes, Y3, #10, pp. 2-4)

Stability and its accompanying sense of well-being had been crucial elements in Howard teachers' willingness and ability to participate in the study. Under the shadow of rumors of Waters' departure, pressure from a hostile superintendent, and fear of being reassigned, teachers no longer felt as comfortable taking risks in their classrooms. The superintendent had made it clear that the standards were to be the first priority. Teachers became overburdened by the dual and, as they perceived, opposing, pressures of differentiating and teaching the standards.

> Once again, today's meeting did not go as I anticipated. From about the moment I sat down, Betsy opened, saying that she wasn't for sure what I had planned, but the group needed to discuss some things and immediately referred to the school's recent biannual plan meeting with the superintendent about the standards. She said that the school had had a rough week and the teachers really needed our help in how to deal with the standards. Betsy then went on to say that she no longer has the time to keep a journal for the project. The demands and stress being placed on them as teachers eliminated reflecting and writing time. She added that her units would have to stop being constructed around a theme. From now on, the standards would be the "backbone of her lessons." Betsy apologetically said, "I have no choice" and went on to explain that checking and measuring mastery of standards would have to be her first priority . . . she said that she was not giving up on differentiation, but it couldn't be done the way it should be done . . . Beth said that she didn't have the time or energy required to do it all. She explained that the pressure was great because the superintendent had told them that if a student was passing a class with an A or a B and not passing the state tests, then the teachers were not doing the job correctly. In Beth's mind, and the others agreed with her, the ultimatum meant that the teachers couldn't differentiate the work for the lower performing students because it would allow the students to pass their class, but not the state tests. (Field Notes, Y3, #10, pp. 1-2)

Because teachers were being held accountable in very obvious ways for their students' performance on state testing, teachers felt they had to give up differentiating instruction. For many teachers, teaching to the standards meant a necessary return to teacher-directed, outcome-based (rather than student-centered) teaching. By the end of year three, even those teachers who had made progress with differentiation were back to a whole-class, direct lecture format (see Howard teacher profiles). However, these teachers remained convinced that considering student diversity in the classroom was crucial to appropriate education—but felt helpless to do so in the educational climate described in year three of the study.

Howard Teachers

Margaret O'Leary. Margaret O'Leary taught language arts in the sixth grade below grade-level team. A career teacher, O'Leary was both a leader among faculty members and a source of support and acceptance for the high-risk students she taught. Her position as the sixth grade matriarch was reflected in her appearance. In her late fifties, she dressed conservatively in skirts and high-collared blouses. She regularly wore a gold crucifix on a chain around her neck. The Christian ethic was an integral part of O'Leary's personal and professional beliefs. Her classroom was decorated with Christian symbols, including a framed print of several quotations from the New Testament and a crucifix hanging behind her desk. She also frequently prayed with her students, a practice to which the principal turned a blind eye. Because O'Leary was so effective in controlling the behavior of her normally unruly students, Waters was hesitant to ask her to change practices that were obviously "working" for her.

O'Leary felt strongly that her mission was to "save" the troubled students who came into her classroom. She viewed her students as wounded birds who needed her to heal them, and saw the role of the teacher as the provider of support, kindness, concern, and an interest in students' lives. She told the Howard coach

> I think probably differentiated instruction, social-emotional learning, multiple intelligences, all of these speak to a very, very Christian ethic about teaching because as Christians we're taught to accept people as they come to us. The change only happens when someone believes in the concepts that Christ gave us. So, when you're able to do that, you're able to forgive weakness and not prey on weakness, but accept weakness, but find strength behind it. You also get the big bonus of you're able to do that and you're able to forgive weakness in yourself. I think it's a lot happier way to look at your life and you tend to give children that attitude of forget, forgive, and build, not destroy and compete all of the time. So, I think there are a lot of things that are mixed in that . . . if you teach children earlier on to love themselves so they can love one another, they stop fighting. (Reynolds, 1999, p. 115)

She strove to make her students better citizens and to provide them with the types of skills she believed they would need out in the world: politeness, ability to get along well with others, ability to work in groups, consideration, and forgiveness. Of prime importance in her classroom was polite behavior; she addressed appropriate behavior both directly and indirectly through the stories she chose for her students to read. Students who were otherwise disruptive were quiet and orderly in O'Leary's classroom, a fact that made other school staff, including the principal, admire O'Leary's skills as a teacher of troubled students and as a school leader. Waters said that O'Leary fills

> a lot of different roles on an instructional team. She sort of has a knack of seeing vacuums and then has a knack of unobtrusively stepping in and filling those vacuums with leadership; to keep discussions moving, to come up with other ideas about how to help students when the conversation has become negative.

> She has turned it around and tried to make it positive, "Okay, then, let's see what we can do about this. Let's quit griping and let's decide what it is we can do. Doing what we're doing is not solving the problem." She leads by example in so many ways but then also leads as she needs to by bringing up topics at the right time, taking on leadership roles throughout the school. (Reynolds, 1999, pp. 117-118).

On O'Leary's agenda for her classroom, delivering content was a distant second to cultivating orderly behavior in her students. She compared her vision of teaching to a river formed by three tributaries:

> The smallest tributary would be the content. I'm never really too worried about what a student walks out of my room with as far as academic knowledge goes. I know that I am charged by the State to make sure that certain things are presented to each student, and I do that. That's the easy part of teaching because it's all written up and it's just there and you grade and you let the students go away with what they choose to take away with them. Um. The teacher's role, though, would be the swiftest flowing tributary, the most driven of all the tributaries into this main river. And number one, support and kindness, concern, and an interest in each individual student should combine to make it just an awesome tributary. One that was just full of rapids and places to stop and look and share and give students pleasure and give students challenge. All of those sorts of things should happen on that river that's a teacher. The river that's the student would be wider and slower, accepting. It would be the one that at times would be murky and muddy and at times be clear as crystal. That it would flow into the same adult, and that adult forevermore would look back at that teacher as a symbol and a sign of what school and education would represent. And hopefully, the picture would be one that showed acceptance, challenge, and support, and a place where you came that not only provided you with a lot of content, but a place where you were affirmed every day. (Reynolds, 1999, p. 117)

O'Leary's devotion to her students' emotional welfare was predicated upon the assumption that these students were essentially incapable of significant academic success. She felt that her time was better spent on making them good citizens than on challenging them intellectually. Her academic expectations for her students, consequently, were very low. Additionally, O'Leary struggled to present challenging lessons as she was teaching outside of her content area. Endorsed in social studies, she taught language arts, and it was evident that her grasp of the subject was modest. "In one lesson O'Leary kept asking the students to identify the mood of the story, but her questions focused on identifying the feelings of the characters" (Reynolds, 1999, p. 127).

O'Leary's vision of the classroom was a traditional one, and she was reluctant to trade it for the student-centered environment that differentiated instruction entails. As the triple-river metaphor illustrates, she saw the teacher as "the swiftest flowing tributary, the most driven of all the tributaries." O'Leary envisioned herself as the undisputed leader of the classroom, the provider and source of all knowledge in the classroom, and the

possessor of the one right answer. The role of her students, the "wider and slower, accepting" tributary, was to listen quietly. Her power in the school, her own and her colleagues' belief in her pedagogical skills, and her personal religious beliefs rendered her confident that her method of teaching was effective and beneficial to the students she taught. "I don't believe that children are going to misbehave in my room . . . . But my belief each day is that they're gonna be really on task students in here because I've got enough for them to do, interesting things, that, and, you know, the rapport that you get with them. And they trust me" (Reynolds, 1999, p. 112). As a result of her confidence in the effectiveness of her methods to tame her otherwise unruly students, O'Leary never fundamentally changed her practices. She was content that she was providing her students with precisely what they needed.

O'Leary did do a tremendous amount of professional reading, keeping up-to-date on the latest innovations in education. Because of this reading, O'Leary was able to discuss educational trends, but her interest in reading about new methods of teaching—and her conviction that she was using them—was not reflected in her classroom practices.

> While it was apparent that O'Leary believed she was modifying her practices in accordance with the literature that she read, her application of these practices was at a surface level at best (Field Notes, Y3, #2, p. 2). O'Leary had difficulty relinquishing control of learning to her students whom she believed were incapable of handling this independence. O'Leary felt that differentiation as presented to her by the coaches was inappropriate for her students; instead, she adopted what she called "Margaret's differentiation:" "I like Margaret's version of differentiation. And I don't know that UVA or anywhere else would. I changed it! I tailored it to suit what I can do with it." (Reynolds, 1999, p. 119)

Of all of the teachers on her team, O'Leary was the most willing to cooperate and actively participate in the study. She was eager to share her ideas, try new things, and ask questions about how to use differentiation more effectively in her classroom (Field Notes, Y3, #2, p. 3). However, O'Leary's heavily teacher-centered conception of teaching and her low expectations of her students (which caused her to place emphasis on social, rather than academic, goals) severely impeded her ability to effectively implement differentiated instruction in her classroom:

> When Margaret described a unit that she and a teammate are developing on "How to Compose a Life," she did not talk about specific ways that the unit could be differentiated . . . all she kept saying was for me to find her cooperative learning activities. If I gave her the activities, she would choose which ones to use. When I asked her about the concept of the unit, she did not have one. Instead, her goal was to teach the kids discipline and safety. She also kept referring to the upcoming Christmas holiday, saying that she wanted the "gifts" section of the unit to illustrate to the students that they were responsible for others and for living in a group. The first part of her unit would emphasize the uniqueness and individuality of the students. I told her that perhaps if we agreed upon a concept and a list of supporting generalizations, we could be more focused in our

> planning. She did not respond to that suggestion. It seemed to fall flat. Instead, she said that she liked the shotgun approach versus the linear approach. "It'll come a quarter at a time," she said. "It'll come when it comes." (Field Notes, Y3, #2, p. 2)

While O'Leary would attempt simple isolated differentiated lessons, she could not let go of her belief that her students were incapable of handling (or learning to handle) a student-centered classroom or challenging assignments. She clearly never understood differentiation as a mindset that allows teachers to meet the specific and unique learning needs of all students, including struggling students. Instead, she viewed differentiation as a "strategy" effective for high-end learners—a group not in her classroom, as she saw it. Despite the fact that O'Leary was largely unsuccessful with implementing differentiation, she clearly believed that she was capable of it and even, at times, practicing "Margaret's version of differentiation" in her classroom.

Beth Michaels. Beth Michaels was a professional-looking woman in her mid-twenties who, at the outset of the study, was in her first year of teaching. Michaels was a member of one of the two sixth grade teams serving "honors" students. During the first and third years of the study, Michaels taught social studies and language arts. During the second year, she taught only language arts. Although not overtly affectionate with her students, she did demonstrate a sincere interest in them through careful listening and well-planned instruction. Michaels was concerned about being fair and appropriate to all students as well as with effectively teaching them. At times, Michaels' definition of fairness interfered with her ability to differentiate for students: "Beth's emphasis on 'fairness' indicates . . . the generalization of 'equality' in fairness [rather] than the realization that fairness entails people receiving what is required for success" (Teacher Observation, Y3, #3, p. 10). Michaels expressed that she was concerned about how students would receive differentiated activities, as students might perceive different individuals being given different work as "unfair" (Michaels Interview, Y2, #4, p. 7).

Michaels expressed a desire to connect with her students on a personal level, but she was concerned about "crossing the line" between professionalism and being a buddy. Her youth and awareness of student interests provided her with a sense of connectedness to the students, a connectedness, however, which she said that she consciously never allowed to stray from the bounds of professionalism (Michaels Interview, Y2, #4, p. 8). She did, however, take interest in her students beyond the confines of the classroom. When one of her students moved to another school, Beth bought her a journal in which "to keep up with her poetry and drawing . . . I'm not going to say, 'I don't teach you anymore—I don't teach you anymore so go away' " (Michaels Interview, Y2, #4, p. 10).

Michaels had a good grasp of her content, although she admitted feeling more comfortable with her knowledge of language arts than with her understanding of social studies (Michaels Interview, Y3, #4, pp. 2-3). Her students routinely explored literature on a deep level, revealing Michaels' own ability to identify the essential ideas of her discipline as well as the high expectations she held for her students. As early as the

beginning of Michaels' third year of teaching, Mr. Waters privately and publicly referred to her as quickly developing into a "master teacher:"

> Beth has had phenomenal growth as a professional. She came here as a first year teacher and she was already quite mature for a young person, a young adult, but she has matured a lot . . . . She is excellent at attaching herself to students that sometimes perhaps other people on a team or on a grade level have not connected with . . . . She is very confident now in her presentation of material . . . and her best leadership is still ahead of her as far as giving back to the staff because the staff has given a lot to her. This is her third year and she's here among a lot of master teachers and she's very quickly becoming one herself and will become more and more of a mentor to other teachers. (Reynolds, 1999, p. 192)

Michaels' classroom was highly structured. She believed that providing structure and direction in the classroom was essential to effective learning. Many of her classroom activities were at least partially geared toward helping students plan and structure their own study time:

> Beth urged the students to consider the pacing of their project work. Everything was due in one week, and next week's class time would not be sufficient to complete the work at school. Beth gave examples of how the students could manage or plan their time: (1) Completing illustrations at home so they could spend school time typing, or (2) staying after school and typing in the computer lab. (Teacher Observation, Y3, #2, p. 4)

Beth also frequently emphasized for her students the importance of following directions: "Before dismissing the class, Beth reminded the students of their homework and warned them to follow their project directions carefully. 'You can be a wonderful, brilliant person,' she cautioned, 'but when you have a job you must follow directions or get fired or demoted. Following directions is a part of life' " (Teacher Observation, Y3, #2, p. 10).

Michaels' emphasis on structure did not, however, hinder students' ability to work independently or remove the joy from the experience of learning. Rather, this emphasis translated into successful instructional management. Michaels' class ran smoothly. An observer noted, "The entire opening of the class operated as a well-oiled machine. The students were quietly sitting in their seats, following directions without assistance or questions" (Teacher Observation, Y3, #3, p. 5). Her careful organization of materials, emphasis on individual accountability, and monitoring of student progress helped support students as they worked independently. Students seemed comfortable in her classroom and with her, and students were typically deeply engaged in their work.

Michaels had a less traditional view of students, teaching, and school than did many of the other teachers in the study. Michaels' classroom was student-centered. She used responsive questioning and allowed students independence, responsibility for learning, and choice. An observer noted that, during a sentence-correction exercise,

Michaels "asked for alternative corrections to sentences, illustrating her understanding that students are a center of knowledge and are valued participants in classroom dialogue" (Michaels Observation, Y3, #3, p. 8). She did not have trouble releasing control to the students, and, in fact, came to the study believing that student-centered classrooms were most conducive to learning. Michaels expressed her beliefs about student differences: "I know that one size doesn't fit all. You do need to try and tailor all of that . . . . They have different preferences and different ways to show success and learning" (Michaels Interview, Y3, #4, p. 4). The alignment of her prior beliefs about teaching and learning with the beliefs about teaching and learning underlying differentiation may have contributed to Michaels' quick acceptance of differentiated instruction.

Michaels held high academic and behavioral expectations for all of her students. She expected them to be highly disciplined and self-motivated, and believed that students rose to the challenges presented to them. However, Michaels held uniform expectations of her students, assuming that all honors students entered her classroom equipped with the skills necessary for independent work. While Beth was a successful teacher of students who were motivated and possessed the appropriate skills to complete a task, she was not as proficient with students who did not possess a minimum competency in certain process skills. She did not always know how to scaffold those students' lack of understanding (Reynolds, 1999).

Michaels was a highly reflective practitioner. During her interviews with her coach, she frequently initiated conversations about the lessons she had just presented and revised units in year three that she had used in year two according to how students had reacted to them. Throughout the study, Michaels was her team's most active and committed participant in the differentiation study (Reynolds, 1999). Initially, Michaels seemed eager to participate, coming to the study with a set of beliefs about school matching those underlying the differentiation model. Michaels felt strongly that differentiated instruction was a more appropriate way to develop deep understandings and teach students higher-level thinking and research skills than traditional, drill-and-practice instruction. She viewed designing a differentiated unit as a positive challenge that encouraged her to grow as a teacher. During the second year of the study, Michaels worked regularly with another sixth grade language arts teacher from the other honors team to construct several differentiated units, units which they revised in the study's third year. She put a great deal of thought, time, and effort into the creation of these units. The combination of the meshing of the study with Michaels' own beliefs and the support she received from working with another teacher allowed Michaels to implement differentiation in her classroom with some frequency.

During the third year of the study, Michaels' participation became more sporadic and less committed. She frequently cancelled meetings with her coach due to migraines and other apparently stress-related illnesses. When she did meet with her coach, she spoke of depression, continual illnesses, family tragedies, and job stresses that she had been experiencing throughout that school year and the toll it was taking on her emotionally and physically.

> The workload is sometimes draining. It's more mentally draining and I find myself . . . like I was on the phone with my mother last week and I had gotten home from school and like five minutes into the conversation I was like, "Mom, I have to go" because I was about to pass out because I was so tired. I couldn't even form a word and I just hung up the phone and, completely dressed in my clothes from school, I fell asleep on my bed for twenty minutes . . . something is wrong because I'm not sure that I'm managing my time the way I should be. Other people have things going on in their lives a lot more than I do. I don't know if it's because they have been teaching more and they can deal with it better. (Michaels Interview, Y3, # 4, p. 11)

The confusion in Michaels' personal life coincided with the growing tensions in the Howard community due to the district's pressures to address the state's standards and the knowledge that several teachers would be moved out of Howard. Michaels knew and worried about the fact that she was one of the teachers facing the possibility of having her position eliminated from Howard. She was eager to remain at Howard and indicated that if she were reassigned to another school, she would resign from her job and leave the profession.

While Michaels appeared to be a confident person, she indicated in interviews that she was feeling "insecure" about her proficiency with differentiation. Although Michaels was, according to her coach (Teacher Observation, Y3, #3, p. 8), producing some of the best differentiated units of the teachers in her school, she routinely compared her work with that of other teachers and felt that hers looked "not that great." She avoided differentiating at all in social studies, even when she was given a complete social studies unit based on her written curriculum. She would only differentiate for language arts, her strongest content area.

> With history I just don't find myself with the time . . . with just preparing and making sure they have some basic things that were ignored in elementary school. Study habits, making an outline, using note cards. There is so much information and I've tried hands-on activities with them and they just lose it . . . maybe I'm not doing a good enough job with it because it's my first year trying it. But I haven't had a lot of success, but I've had a lot more success with just them doing an outline or making note cards or something a little bit more structured, traditional. (Michaels Interview, Y3, #4, pp. 2-3)

During the third year of the study, she continued to use and modify the differentiated language arts units she had created the year before, but felt that she had to "push all that aside" because of the pressure to teach to the standards. She indicated that she did not have the time or energy required for "doing it all"—regular school responsibilities, planning for the standards, and differentiated instruction practices.

> Lately, [differentiation] has become more of a burden . . . it is because of the standards pressure and this year has been very difficult. I've found myself very stressed out. The holidays and the climate of school right now. We are still

> trying to make sense of this other stuff, too . . . the standards and what we are going to have to be doing with that. And another meeting we are going to have to come up with. So right now, it seems like [differentiation] has almost been put on the backburner. (Michaels Interview, Y3, #4, p. 5)

Consequently, Michaels' involvement in the study during the third year dropped significantly.

Betsy Talbot. Betsy Talbot was a slender, petite woman in her mid-forties who, before coming to Howard, had been a preschool teacher/director. Four years prior to the beginning of the study, Talbot received her teaching certification and had been teaching middle school students ever since. During the span of the study, Talbot taught seventh grade social studies and history.

Talbot had a deep understanding of her content (Field Notes, Y2, #5, p. 1; Field Notes, Y2, #7, p. 1). She had an obvious love for history that displayed itself routinely in her classroom and was apparent to her students. However, her own thorough knowledge of history often made it difficult for her to understand when her students didn't quickly grasp the ideas she was trying to impart. While Talbot showed clear enthusiasm for her subject, she did not know how to communicate the essential ideas of the discipline to students through varying paths. (Field Notes, Y3, #8, p. 2)

While Talbot strove to give students independence in their assignments (Teacher Observation, Y2, #7, p. 6), her classroom was generally teacher-centered (Teacher Observation, Y1, #3, pp. 5-8). Even though she was a friendly, soft-spoken, kind teacher, Talbot was relatively inflexible about procedures in her classroom:

> Betsy tells her students, "You will research in your groups. This is an individual grade, and you don't have to work in a group. So 15 points is your notes that you will explore in the Vital Links program. OK, look at your directions and put the newspapers down. After you have taken notes you will come back to the table. If anyone wants to stay back and explore more they can. Then you will come back to your table and you can work on it. If you lose your sheets, then you will lose points. You can take some stuff home, but you don't need to. Dictionaries are here to help you. Any questions so far? When you get to your station you will begin at the title page and when you get to the main menu, go to ALL and punch in the 1940's." (Teacher Observation, Y 2, #7, p. 4)

However, her students spoke frequently of how much they enjoyed the differentiated projects and activities that she implemented and always seemed happily engaged in their work in her classroom (Teacher Observation, Y2, #7; Student Interviews, Y3, #5). The differentiated lessons that Talbot created were usually quite creative and designed to tap into different student strengths:

> How I determined my groups, red, white, and blue—it was, red was the ones I knew had exceedingly high thinking skills and could take some difficult reading

> matters. Some of them struggled with it, like quotations directly from Benjamin Franklin . . . . Some of them soared with it and a few of them still struggled, but that was okay. Then my white group was I guess what you would call the lower group, the ones who have trouble keeping a pace, keeping up with following directions and those types of things. So I tried to differentiate a lot in the way their directions were and how they had to do things. Then my blue group, I guess is what you would call the middle group—and I tried to vary it always—vary the colors and it gets—it would be real easy for me to say red, white, and blue, and have high, middle, and low, but after a while I think it would be too apparent. So I'm always switching those around and sometimes I get confused, but, anyway, we're getting there . . . . I made sure that each group had one artistic assignment. The higher group had the political cartoon, another group had to create wanted posters for crimes against England, and another group had a comic strip to do. (Talbot Interview, Y2, #1, pp. 4-5)

Talbot tried many of the strategies that she learned in in-services, including cubing and tiered assignments, but she held control of choices. She did not think that she could organize and teach material conceptually, as she believed that this organization would prove too abstract for her students. She did, however, speak of how she would like to eventually integrate a concept into what she was teaching: "Betsy shares with me a graphic organizer that the students are using and hopes that next year she can connect all the units to concept of 'Revolution' " (Teacher Observation, Y2, #7, p. 3).

Despite her hesitance to give students control over their own learning, Talbot participated eagerly and consistently in the study. Talbot continually strove to improve her teaching, and was thoughtful and reflective about her use of differentiation in the classroom:

> I try to have a variety of learning activities. My textbook tends to be rather difficult for even some of my very highest students. One thing I've learned this year through the course is I try to pull in different types of activities for different levels of reading and then have different groups perhaps doing a different type of reading and maybe doing a presentation on their reading or answering perhaps the same questions, depending on what I'm doing. For example, last week when we were doing Lewis and Clark's expedition, I had several samples of primary resources from that time period and one sample was an interview of a Native American. It was very difficult reading and also you have to get into the viewpoint of the Native American. Then my other samples dealt with some journal entries of Merriwether Lewis. They were a little easier reading. So I had those split up and then what I did was—my students were split to do their own individual reading and to answer questions . . . . What I'm getting myself into is even beginning to earmark the questions I write toward the student instead of just going through the reading. (Talbot Interview, Y1, #4, p. 1)

She routinely spoke to her coach about how she had used a particular strategy, what worked and what needed adjustment, and analyzed her progress on the path toward becoming a full implementer of differentiated instruction.

> I had always felt that I know I'm really missing something. I know I'm just not hitting it for this child. I always felt successful, but like I never really reached it all and differentiation is—I don't feel like I have really reached it all, but this is helping me make certain that the child that was so bright who I thought I was losing and the child that was so handicapped that never got there—it's helping me think a lot more and it's certainly given me great ideas on how to incorporate things for both types of student. It's something that I know I'm going to be working on over the years and I feel like I've started. I feel a lot better about that aspect of my teaching because of it. (Talbot Interview, Y1, #4, p. 12)

Talbot could accurately recognize and verbalize both her weaknesses and the areas in which she had grown. During the first two and a half years of the study, because of her excellent grasp of her content and strong commitment to differentiating, Talbot seemed to be on the path to creating a differentiated classroom. However, in December of year three, Talbot simply gave up.

Talbot had always remarked upon the amount of time it took to create differentiated lessons, but had felt that the time was well spent: "Even though the big project on the Revolution took a long time, I felt quite happy with it when it was over. I loved the things I learned, the vehicles they taught me to use in it" (Talbot Interview, Y1, #4, p. 12). She felt strongly that participation in the study was challenging her to grow as a teacher and making her a more proficient professional:

> Sometimes you feel a little stressed trying to make sure you do get it all in—but this is important enough to me. I feel its importance. It's something I want to do well as a teacher, it's a goal for me. But I'm the kind of person, I can set that goal, but I can also let it unfold over a period of time. I don't necessarily have to be perfect at it today, but I'd like to be perfect at it in about five years. (Talbot Interview, Y2, #3, p. 15)

However, in the middle of the third year, the pressure of teaching to the standards overwhelmed her, and she expressed how incapable she felt of preparing students for the state tests and differentiating instruction. She felt that the philosophies underlying state tests and differentiation stood in complete contrast to one another, and couldn't see how they could possibly co-exist in the same classroom. In her own words, "I just can't differentiate. There is no time" (Field Notes, Y3, #6, p. 2).

Her decision to abandon differentiation, which Talbot felt was forced upon her and beyond her control, clearly shook her (Talbot Interview, Y3, #7, pp. 1-2). Over the course of the study, she had become convinced that differentiated instruction was the best method of addressing all students' needs, and, although she knew she wasn't yet fully proficient in it, had set as one of her professional goals mastery of differentiation:

> I'm never going to be satisfied with myself . . . . I'm not going to let go of differentiation at all. I had thought it would probably be the soul of my teaching. After this year, to progress a little bit further, and I didn't know when it was going to happen, but somewhere after the differentiation programs, I've had three years of it. Maybe by my fifth year I will have everything basically differentiated. That was something I was thinking about. (Talbot Interview, Y3, #6, p. 13)

Talbot was *excited* about differentiation and its possibilities for her classroom and her students: "I never have understood why some people wouldn't embrace [differentiation]" (Talbot Interview, Y3, #6, p. 13). But as the pressure to teach to the tests intensified, she felt she had no choice but to let go of this way of teaching to ensure that all of her students were familiar with the highly fact-based social studies standards:

> I would say that I am a good way on the road [of differentiation], but a roadblock has definitely been put up. When I say a roadblock . . . with the amount and the difficulty of the standards I must cover, I have to be sure that every student has actually heard and dealt with everything independently and I can't depend on that with a lot of independent work. The amount of time involved with taking a concept and creating a whole unit with it, I am not talking about my planning time, I'm talking about the class time itself. I no longer have any to spare. (Talbot Interview, Y3, #7, pp. 1-2)

Once a highly active and eager participant in the study, Talbot began avoiding seeing and talking with the coach (Field Notes, Y3, #8, p. 1). As a result of feeling forced to teach in a way that she believed was inappropriate, Talbot's confidence in herself as an effective teacher was deeply affected:

> Betsy said that her units would have to stop being constructed around a concept. From now on, the standards would be the "backbone of her lessons." Betsy apologetically said, "I have no choice" and went on to explain that checking and measuring mastery of standards would have to be her first priority. Betsy described herself as "drowning." She said that she was not giving up on differentiated instruction, but that it couldn't be done the way that it should be done. She ended her opening comments by saying, "I can't do any more. I'll do the best I can. They can fire me." (Field Notes, Y3, #10, p. 1)

Sally Morgan. Sally Morgan was an experienced eighth grade science teacher with an air of positive energy. She had a visible connection with her students, who frequently surrounded her, chatting with her and asking her for advice. Students lingered around her desk to speak with her after class (Field Notes, Y3, #1, p. 1; Field Notes, Y3, #2, p. 1). The students clearly liked her and wanted to be with her: "It is like she has knowledge and ideas that the students want to have, and perhaps if they stay with her, some little bit of the magic will transfer to them. The children who flock to her seem to rotate; it isn't the same four or five each time I notice. The charisma seems to pervade every group she sees" (Field Notes, Y3, #2, p. 1). In turn, she seemed to thoroughly enjoy her students: "I think she really loves [her students]. She seems to need to be near

them while they work. She seems tickled by their responses and the wonder at using a stopwatch. It seems genuine" (Field Notes, Y3, #1, p. 3). She did not mother them or try to befriend them, but she talked to them in a comfortable, friendly manner (Teacher Observation, Y2, #3, p. 3).

Her classroom was inviting and colorful. A large piece of yellow butcher paper was attached to the wall near her desk, displaying a collage of photos of students in various poses and engaged in various home activities. Just outside of Morgan's door, she had posted a sign that she made by hand: "You can't buy it. You can't rent it. You can't lease it. You can't borrow it. You can't steal it. You can't fake it. You just do it. Excellence" (Field Notes, Y3, #1, p. 1). Inside, a pet parakeet contributed to the room's general student-friendly feel. The juxtaposition of the "Excellence" poster with the class parakeet symbolized the balanced way in which Morgan approached her students: While she held high expectations of them, she remained in tune with what interested and engaged them.

Morgan's classroom was lively and student-centered. Her students were accustomed to independent, active work, and individual as well as group work proceeded smoothly:

> Sally had created numerous labs that were easy to set up, but very directed at teaching a concept. The students worked quickly through some and pondered a little more at others. They did not seem rushed to "get through" all the stations since they would have more than one day to tackle them. When I questioned a few students about the labs, many of them got the concepts. Some tried to "do" the lab without really recording findings or a hypothesis. Sally had the freedom to gravitate towards stations that seemed to need further prompting or clarification. She did not spend her time all with one group, but floated throughout the stations. These stations were created to be sense-making activities to lead to a final exam. (Teacher Observation, Y1, #1, p. 6)

Students were engaged and self-monitored during their activities and the atmosphere was routinely joyful (Field Notes, Y3, #1, p. 3). While students worked, Morgan watched with pleasure, enjoying witnessing her students discovering science. She encouraged risk-taking, limit-stretching, and continual self-evaluation in her students, reinforcing the idea that it is okay to start over if something doesn't work. An observer noted that the students "are used to independence and mobility" (Field Notes, Y3, #1, p. 3).

Morgan was unique in that she was one of the few participating teachers who explained to her students the idea behind differentiation. She told them, "This is like a prescription. Not everybody is going to take the same medicine. Not everybody is going to go the same speed if you're out traveling, the same destination. We're trying to go to the same place, but we may take a different route to get there" (Morgan Interview, Y3, #3, p. 9).

As a teacher, Morgan lived by the same "if at first you don't succeed, try again" attitude that she promoted to her students. She attributed her success with differentiation to "taking off small bites at a time and saying, 'Ooo, that really worked,' or 'That didn't work.' Rather than chucking the whole thing, what are some things that didn't work that I can take out of the contract?" (Morgan Interview, Y3, #3, p. 12)

Morgan's deep knowledge of her content, her strong connection to students and their interests, her natural reflectivity about her practice, and her solid pedagogical skills allowed her to move quickly along toward full implementation of differentiation in her classroom. Even as the standards initiative became an intimidating presence to other teachers, initially Morgan remained certain that she could reconcile the standards and differentiation (Teacher Observation, Y2, #10, pp. 1-2). She did, however, feel the pressure from the superintendent to completely adhere to the standards and to ensure that student test scores rose from previous years. Morgan was particularly concerned that the previous year's test scores would be compared to the current year's. She knew that the current year's test scores would be lower, as her current group of students was much weaker than the one she had the year before (Morgan Interview, Y3, #6, p. 3).

The pressure that the superintendent put on the school to raise test scores took its toll on Morgan's typically creative and lively approach to teaching. An observer noticed the difference in Morgan's teaching style after the teachers' meeting with the superintendent:

> The children enter the room more quietly than I have ever seen in my previous visits. Some students talk to each other as they enter, but most move quickly to chairs and begin working on the overhead's task. I am conscious of how focused the students are on completing this task. In my previous visits to Sally's class, I have not seen this overhead-complete-work-as-you-enter-the-room strategy used . . . I am struck by the shift in the way this class is formatted from previous visits to her classroom. (Teacher Observation, Y3, #5, pp. 2-3)

Morgan herself noted the change in her teaching emphasis: "So right now, I have to admit, quite honestly, that I have done a lot with 'these are the standards, this is what we're gonna know, these are the facts' . . . I think we're all pulling at the reigns very tight and saying, 'okay, I must be real strict and structured for a while' " (Morgan Interview, Y3, #6, pp. 2-3). Morgan expressed her dissatisfaction with having to teach this way: "It's not particularly teaching that I thrive on, because it's very 1-2-3, here you go, when they know it, then let's move o." (Morgan Interview, Y3, #6, p. 2).

Over the course of the third year of the study, Morgan slowly became frustrated with the school's mid-stream shift in expectations: "I was getting my feet wet with differentiation. So then they put us on a different track and okay, put a foot over here and a foot over here, you can't be spread too far" (Morgan Interview, Y3, #6, p. 5). While she could recognize the relationship between the two initiatives, she was not yet sure of how to effectively incorporate both into her classroom practices: "With the onset of the standards, I feel like I am being torn in two ways" (Teacher Interview, Y3, #6, p. 1).

Morgan felt strongly that students benefited from differentiation, and was proud of the strides she had taken with it. She was clearly reluctant to put it aside: "I want to do well with differentiation. Make it work. And then my next step for myself is to internalize, okay, now let's see if we can have a nice healthy balance with it. And I don't feel if I were to rate myself, that I was good at that yet, or that I'm comfortable with it yet" (Morgan Interview, Y3, #6, p. 5).

Yet Morgan clearly felt forced to place emphasis on teaching to the standards in her classroom because of threat to her job if her students did not perform well on the state tests:

> Right now in my classroom, the balance is shifted very heavily on standards, just because there's such a thrust on everything. It's been indicated, you know, that there's teacher accountability and it's very pressured right now, to be very honest with you. We're feeling a lot of pressure, the teachers are . . . . You read it in the paper, you have public conceptions, misconceptions, whatever. And it's scary and you know scores are gonna be coming out . . . . It's a scary situation. (Morgan Interview, Y3, #6, p. 2)

Morgan believed that the pressure and the fear that the state testing program brought upon teachers was taking its toll on teacher morale: "It's a lot of negative feelings that are being placed, I think, professionally on teachers. And so I think the morale sometimes slips. I've seen it slip . . . I think that part is an emotional burden that's kinda hard to handle" (Morgan Interview, Y3, #6, p. 3).

Langley Middle School: Differentiated Authentic Assessment Treatment

Setting

Langley Middle School was a large school, even by the crowded district's standards, in the shadows of an urban center in the southwest. Located in a section of the city near busy interstates, recent nearby additions such as trendy boutiques and popular department stores made the area highly congested and a popular place to shop. The school was situated at the end of a winding neighborhood adjacent to these shopping areas. The lower-middle-to-middle-class subdivision, built in the late 1960s and 1970s, was full to building capacity of ranch-style homes on small lots, positioned close together. The small single-family houses were neatly kept and landscaped with mature trees. To access the school, one had to wind through this neighborhood's streets, down the narrow roads, making many turns to land on the dead-end streets that crossroad at Langley Middle School.

By district policy, trained dogs were regularly brought into the school to detect the presence of drugs and firearms, and a resource officer was housed at the school full-time to promote a safe school atmosphere. The climate was orderly, focused on the business of school, appropriate behavior, and preparing for state tests. An observer/coach at the school reflected that:

> Attention to the test permeates everything like ecclesiastical incense in a cathedral. It is in the instruction (pervasive [test-like] writing prompts). It is in the teachers' conversations ("this is the kind of problem you will see on [the state test]"). It is in the décor ([state test] posters displayed in each classroom). (Exit Interview, Y3, #1, p. 6)

An emphasis on laughter or the joy of learning was not a focus at Langley. Most of the students at Langley were Hispanic or African American, with a small percentage of White students. The school was perceived by many to be less focused on academics than others in the district, and was not considered one of the most highly regarded middle schools. Its reputation instead was for having a cordial and well-meaning environment. Official school policies did not include tracking, but many individual teams made private decisions to regroup students by academic ability, inflexibly reconfiguring classes within teams for the semester, or often the year. Social studies teacher Rhonda Miller explained how ability grouping had to be done quietly, as it conflicted with the district's policy on heterogeneous grouping.

> [We are not ability grouping] officially, but that is another thing that [the administration] allowed us to reschedule some of our kids so we were able to get the gifted and talented kids together and to even have the kids that maybe are terrible in math, maybe they flunk math every six weeks but they are whizzes in social studies . . . . And basically it is kind of an under the table thing because district-wide we are supposed to have heterogeneous grouping . . . not [ability groups]. (Miller Interview, Y3, #4, p. 11)

Principal

The principal, Mr. Ron Connor, was a Caucasian man in his mid-to-late fifties. He was cheerful, friendly, and communicated an easy going nature. Described as a "good old boy," he wore cowboy boots and a weathered leather belt with a large buckle that highlighted his prominent waistline. He had gray, balding hair and a moustache that he idly stroked and straightened when he talked. He was promoted to principal at Langley from his position as assistant principal in the second year of the study. Early in the third year of the study, he suffered a heart attack and was out of school recuperating until the second semester. His frequent school absences, coupled with his hands-off style of management, contributed to the teachers' independent classroom behaviors. Mr. Connor was not the instructional leader in the building; when asked about individual teachers' teaching styles, he was hesitant to respond, unsure about exactly how teachers conducted business in their classrooms. During an interview in the third year of the study, he seemed uncertain of the purpose of the study, and admitted that he "put the project on the back burner" (Conner Interview, Y3, #1, p. 6). He gained his information about the project from key teacher-leaders in the school, notably MillieAnn Carpenter, an eighth grade English teacher, and repeated many of the same phrases and concerns she raised (see profile of MillieAnn Carpenter). It was evident from observation that Mr. Connor liked the students at Langley; he provided the morning announcements, complete with the spirited Langley cheer (Field Notes, Y3, #2, p. 1). He walked the halls at each

passing period, and knew many of the students by name. Despite the large size of the school and faculty, all the students recognized Mr. Connor when they saw him in the hallways, and while many never spoke directly to him, all of the students knew that he was the principal from his familiar voice and unmistakable appearance.

Four Teachers' Approaches

Joan Borden. Joan Borden was a small-boned, petite woman in her mid-to-late forties. She wore her hair stylishly short with seasonal auburn highlights. She dressed professionally in tailored jackets and stylish suits, and she carried herself with a business-like affect. There was no mistake: She unequivocally meant business in her seventh grade science classroom. She was an experienced teacher who managed students' behavior effectively and overtly. Her authoritarian nature (with students and adults alike) and loud, gruff voice intimidated some of the observers who coached and interviewed her. The coach at Langley quipped that coaching Ms. Borden was akin to hugging a porcupine (Field Notes, Y2, #3, p. 1). An observer/coach reflected on an initial meeting with Borden:

> One day I walked in to talk to her and leave something for her . . . and kids started acting up behind us and she gave one of those . . . she was talking to us in a quiet voice and all of a sudden she said, "excuse me" and just laid the class flat. I am standing in front of the room and I'm thinking, "this is like it was when I was in first grade, I've just been humiliated in front of the group." It wasn't directed at [me] at all, but I tell you, I felt like it had been. I literally felt the rush of the fury going by my ears and eyebrows. I thought, "I'm doomed here." The tension in her body stance, the volume of her voice, the piercing way she would look at kids or other people when she was displeased was an astonishing thing to me. I was undone by it. I thought to myself, "children are having nightmares at night, they are terrorized by this woman." (Coach Exit Interview, Y3, #2, pp. 41-42)

One observer noted that Ms. Borden was "an acquired taste" (Field Notes, Y2, #3, pp. 1-2). She was clearly a paradox: Her acidic tone of voice, her fury and palpable anger—democratically dispersed to anyone in her path—may have terrorized students in the same way it terrorized some of the adult onlookers. But, at the same time, she insisted on extremely high standards for students in behavior and in work products, and she continued to push herself professionally to reexamine her own teaching practices. Underachieving students seeking a warm, fuzzy educator to nurture their secret potential did not get their needs met in Ms. Borden's classroom. Militaristically, she cut no slack: Students' most diligent efforts coupled with objective accuracy was what she expected and demanded. Students from Ms. Borden's team who were interviewed remarked on three qualities: her clear explanation of assignments, her unrelenting expectation for high-quality work, and her harsh, often acerbic tone of voice.

> I like [Ms. Borden's rubrics] because if I have it specific, I know exactly what I'm gonna do, and if there's just a little open . . . . I can still have a little creativity in

> there, and do a little more things, and still get what she's asking for. (Student Interview, Y3, #3, p. 12)

Ms. Borden was different from her peers at Langley: She consistently maintained high standards for student behavior and student work, and, through the study, she reexamined her instructional practices, shifting from an initial resister (erupting in a professional development session airing her concerns about authentic assessment) to an implementer (selecting and fully implementing a differentiated authentic assessment and using a rubric to score the student products). The shift from cynicism and resistance to redefining instructional practices suggests a shift in her teacher belief systems—a genuine rarity among most study teachers.

MillieAnn Carpenter. MillieAnn Carpenter was an experienced teacher in her late forties. While she held a Bachelors and Masters degree in history, her teaching assignment was eighth grade English composition and literature. The third year of the study marked her 25th year in the classroom. Despite her career teacher status, she emitted a less than professional aura. Her school wardrobe frequently consisted of denim blue jeans and untucked blouses hanging almost to her knees, projecting an unkempt image. She frequently played new age music in her classroom, appeared mellow and low-key, and was consequently described as an aging hippie (Field Notes, Y2, #1, p. 2; Observation, Y3, #1, p. 1). Both in the hallways and while instructing her classes, Ms. Carpenter constantly clutched a coffee mug and was known to drink her brew either hot or cold. Despite her appearance and seemingly casual attitude, she was perceived as an informal leader in the school, both among her fellow teachers and with the administration—a role she seemed to value. In conversation with observers and interviewers, she could speak intelligently about what practices she believed were best suited for middle school students, about the many classes she had taken in gifted education, and often made broad statements about the kinds of things she was working on for her classes at Langley. Based on the things she said in initial informal conversations and interviews, observers inferred that she possessed sophisticated pedagogical skills and the ability to implement effective, high-level instruction in her classroom (Field Notes, Y1, #2, p. 1). However, in the following 3 years, these first impressions were never validated by actual observation. One observer/coach in her exit interview about Langley reflected about how little MillieAnn (and her eighth grade teammate Rhonda) changed over the course of the study:

> They don't know their content, but on top of that, they don't know . . . they're really the kind of ones that are able to talk the talk, but can't walk the walk. Rhonda less so than MillieAnn. But she knows a couple of key words to say and key ideas to mention and so you get this sense that she kind of . . . that she's there. But when you stop and you start probing and you start really trying to carry her thinking . . . to flush it out, she can't carry the complete thought [through to fruition]. (Coach Exit Interview, Y3, #1, p. 9)

Over the course of the study, observers saw Ms. Carpenter incorporate only one novel, *Maniac Magee*, a realistic fiction novel on approximately a fifth grade reading

level into her Language Arts instruction, and this was used only after the state writing test was completed. When pressed by observers about other literature selections that were covered outside the frequent observations, she nervously retreated, rationalizing, "I am really a history major" (Carpenter Interview, Y3, #1, p. 7). At other times, she would explain her instructional decisions by saying that the state emphasized writing over literature: "That is what I am responsible for. Teaching them how to write" (Carpenter Interview, Y3, #1, p. 6). She acknowledged that writing and reading were separate entities in her classes, and admitted her limited skills in teaching reading and literature.

> There are a lot of English teachers that say writing and reading should not be separate. I see some value in that idea. I'm just not quite as well versed in [teaching reading] as I am about the writing process itself . . . . They have to learn how to write in an organized fashion. (Carpenter Interview, Y3, #6, p. 3)

While she acknowledged limited skills in teaching reading, she also chose not to use the resources available to her.

> I don't even have the English textbook in my class. I have literature books in my class that we very seldom use, but the English textbook I don't use because I don't see any purpose in it and research shows that it doesn't help the kids to do worksheets on grammar. It doesn't make that step over into their writing. (Carpenter Interview, Y3, #6, p. 4)

She revealed during interviews that she believed she incorporated performance assessments in her classroom because she used the state holistic writing rubrics to score formulaic writing prompts: "I always use a rubric with the kids when I have them write" (Carpenter Interview, Y3, #6, p. 1). In Carpenter's mind, the rubric was the key to authentic assessment.

Rhonda Miller. Rhonda Miller, a short, heavyset woman in her late forties with a prominent smile, began her teaching career in the recent past, moving from substitute teaching into the full-time history position at Langley through a personal connection outside of school to MillieAnn. While she taught eighth grade history during the day, her true passions were cheerleading and football, and consequently she served as a cheerleading sponsor for the school. She closely aligned herself with Ms. Carpenter, which protected her politically and gave her "power by association" with colleagues and administrators. MillieAnn and Rhonda seemed virtually inseparable, leading observers to believe the two teachers were more alike than different. However, Miller and Carpenter were quite different in their observed classroom practices. Unlike MillieAnn, Rhonda was an enthusiastic, bubbly teacher who liked kids and interacted easily with them. Her classroom was congenial, she lightly joked with students and students expressed positive remarks about her classes. She was efficient at managing groups of students and frequently incorporated multiple versions of activities into her lessons. While her attempts at differentiating instruction were shallow, they seemed to rise out of her recognition that despite her team's attempts to create homogeneous classes, her students were varied in terms of prior experiences and knowledge of history. Based on initial

observations, Rhonda seemed an ideal candidate for moving to the next level: incorporating an authentic assessment and scoring student responses with a rubric. According to the researchers and the coach, this goal never transpired during the project. On the other hand, Miller believed she was progressing toward project goals. When asked to describe her efforts toward creating and implementing authentic assessments in her eighth grade history classroom, Miller described a project where students created compact disc (CD) covers that contained imaginary titles of songs that reflected their understanding about Civil War events. What Miller believed to be her attempts at implementing authentic assessments were in actuality classroom instructional projects. The project she described did not culminate the unit of study about the Civil War, did not elicit information from students to determine mastery of the objectives for the unit, and was followed by further instruction on the topic as well as a traditional pencil-and-paper test. Miller's misunderstandings about the distinctions between an authentic assessment and an instructional activity (project) were revealed in her description about the Civil War task.

As teammates, MillieAnn Carpenter and Rhonda Miller often worked collaboratively, even teaching a concept-based unit in the third year of the study using the theme of rebellion/revolution. In response to observers' questions about literature selections, MillieAnn explained that, "I don't really have time for them to read . . . [the unit is] just three weeks" (Carpenter Interview, Y3, #1, p. 5). Rather they would watch excerpts of popular television programs from the 50s and 60s as a substitute for interacting with literature.

> Like for the role of women, they could watch "Every Girl Should Be Married" and "How to Marry a Millionaire." For the [role of the] Negro [sic] it could be "Imitation of Life" or "Blackboard Jungle." For [the role of the] youth, "Rebel without a Cause." For national politics, "On the Waterfront" maybe . . . . I don't really know. I want them to see some "Ozzie and Harriet," "Father Knows Best"' "I Love Lucy." They can see some of this on Nick at Night. (Carpenter Interview, Y3, #1, p. 2)

It was unclear if the unit contained any specific objectives, and no assessments were built into the unit despite the fact that project staff created an authentic assessment task and rubric based on their specifications specifically for use with the unit. For MillieAnn and Rhonda, teaching out of their content areas hindered them from grasping essential concepts and effectively communicating them to students.

Ms. Carpenter and Ms. Miller seemed to feed off each other's energy—often cynical and pessimistic. Their collaboration seemed to work against the objectives of the project. Part of their cynicism may have been a response to the invitation to change their instructional and assessment practices. Carpenter reflected on her own challenges to change.

> I've been teaching, this is my 25th year and back when I started . . . cooperative grouping was not taught. We just didn't do that. Everybody was in rows and we

> sat and did our work and although I've learned to teach different things, it has been really hard for me to switch over and teach differently. I know it is like teaching an old dog new tricks and I know that the kids need this. (Carpenter Interview, Y3, #6, p. 3)

Another part of their cynicism might have been related to disappointment in the school's assignment to the differentiated authentic assessment treatment group, rather than the differentiated instruction treatment (which was assigned to a rival middle school in the same district). Both Carpenter and Miller attended training sessions in differentiated instruction prior to the beginning of the study, and expressed some regret that they could not continue as a part of the project. Carpenter's attitude about the change process and the differentiated authentic assessment treatment group did not stop her, however, from inviting other teachers to change—providing professional development across the district on a variety of subjects, including differentiated instruction, instructional strategies, and addressing the needs of gifted students. Interestingly, despite the assignment of providing differentiated instruction in-service to teachers in the district, Carpenter and Miller could not see the relationship to differentiated authentic assessment—both approaches designed to address students' academic diversity.

Jonas Ekele. Jonas Ekele, a native of Nigeria, was a sixth grade math and social studies teacher at Langley. He received his educational training in England, and his accent clearly reflected this influence. He viewed himself and his job as highly professional; he carried a briefcase to school each day, came early and stayed late many evenings to attend to the details of teaching. He served as the team leader for his sixth grade team and was viewed by his fellow teammates as a quiet but effective leader. He avoided the inevitable politics of school, yet politely spoke out when necessary to protect the interests of his students and his team. He consistently and reliably honored all school tasks he undertook, including his position as the research study site contact for Langley throughout the study. Mr. Ekele used instructional time very wisely; he began teaching before the bell rang and did not stop instruction until dismissal. To Mr. Ekele, every moment was a potential instructional moment, and he maximized each to its fullest. Students understood his tacit classroom routines, immediately beginning work after entering the classroom, and respecting classroom rules and procedures. Mr. Ekele knew his students well, both in terms of their styles and preferences for his class and the way they reasoned through problems. As a result, he was able to provide several worksheets tiered according to varying skill levels to best match individual student needs. Even within the honors designated classes, he recognized the diversity of students and prepared varied materials for them. He communicated high expectations for students, both in the quality of work and their level of participation in class. He communicated when the work was advanced for the grade level and explained how the assignments he gave were important. He was, however a very traditional teacher; students sat in rows, little to no group interaction occurred, he used lecture and direct instruction as his predominant instructional strategy, and assessments usually translated into pencil-and-paper tests.

At one point in the study, Mr. Ekele attempted what he believed was an authentic assessment task in his social studies classes. In actuality, students were charged with

making a poster of a culture they recently studied with surface level information such as population, natural resources, and geography—information easily retrieved from the Internet. It was evident from observations and conversations that he was proficient with his content; there seemed to be a gap in his understanding of authentic assessments, and despite his high expectations of students, the learning activities he created mostly required recitation and drill.

Rockford Middle School: Differentiated Authentic Assessment Treatment

Setting

Rockford Middle School was located in the poorest section of a small, highly economically segregated city. The neighborhood in which the school was located was unsafe and rundown, although the school building itself was well-kept and attractive. At the time of the study, the school had been recently renovated. Every classroom was equipped with at least one computer with Internet access and a TV, the library was modern and comfortable, and a new computer lab housed the latest technology.

Despite the school's shiny appearance, inhabitants of Rockford felt that the school was the "low man on the district totem pole." During one year of the study, the Internet at Rockford was down for 6 months before it was fixed, reinforcing the school community's feeling that Rockford was a low priority for the city. The school did not have its own gymnasium, and students had to cross the street to a neighborhood park for physical education.

Rockford's students were primarily economically disadvantaged, although the school also served a handful of economically well-off students. Student stories were often disheartening. Teachers talked about the many students from troubled homes, a female student who had turned to prostitution, and students who routinely ran away from school. Test scores at Rockford were lower than scores at the other schools in the city, and absenteeism was high. Fights among students were common. During interviews, students consistently talked about the necessity of "keeping to yourself" in the halls to avoid confrontation. Parent involvement in the school was extremely low. When asked by a coach whether parents volunteered in the school, one teacher laughed and said, "Parents? What parents?"

Upon first entering Rockford's doors, visitors were greeted by a colorful foyer decorated with student artwork and a plaque celebrating the student of the month. The initial impression Rockford gave was one of positive engagement in student lives. The glass-walled office gave a different impression. Students with discipline referrals were permanent fixtures in the office, lined up along the wall, waiting to meet with the principal. A uniformed policeman was stationed visibly in the office. The secretary at the front desk responded to student requests inconsistently. One student who approached her and asked to borrow a pen was berated and sent out of the office, the next greeted warmly and allowed to take a pen with her to class.

Such inconsistency of treatment of the people populating the school defined the atmosphere at Rockford. Researchers described Rockford as a place to approach with caution. They never knew what the school's atmosphere would be on any given day (Field Notes, Y3, #1, p. 1; Field Notes, Y3, #5, p. 1).

Principal

The somewhat schizophrenic climate followed in large part the fluctuations of the principal's own moods. While the principal, Sarah Dodge, tried to appear to researchers as though she treated her faculty well and respected them, it was apparent that the teachers felt that she treated them like children and that they had very little power to make decisions (Field Notes, Y3, #7, p. 2). Dodge had low expectations of her teachers and appeared untrusting of their abilities and suspicious of them (Field Notes, Y3, #8, p. 1). Teacher lesson plans routinely had to be turned in and checked by Dodge, and teachers were not allowed to use the copy machine. Dodge's leadership style was one of maintaining control over her faculty by stripping them of decision-making abilities, but her own powers of decision-making were weak. She would frequently issue a directive to the faculty, change her mind, and then rapidly issue another directive (Field Notes, Y3, #8, p. 2). Under this inconsistency, teachers expressed uncertainty about "where they stood" with Dodge and how secure their positions were. Dodge rarely told teachers where or what they would be teaching the following year until late in the current school year for fear of upsetting the faculty members who would be changing schools or subjects (W. Miner, Personal Communication, September 2000).

The result of the combination of Dodge's controlling, distrustful, and inconsistent leadership style, along with the pressures of teaching largely disadvantaged students, was a largely underachieving faculty (Observer Exit Interview, Y3, #9, p. 3). The quality of teaching at Rockford was low. Teachers generally did not take risks or reflect deeply on their teaching. The principal told an observer that many of Rockford's teachers had been assigned to Rockford as a "last resort" and that she had had to take them to give them a last chance (C. Callahan, Personal Communication, February 2002).

As Dodge expected very little from her teachers except obedience, generally teachers did not appear motivated to strive for excellence (Teacher Observation, Y2, #1, pp. 1-12). Teachers seemed aware that survival at Rockford was a matter of listening to Dodge and doing what she said. One teacher referred to placating her as "playing the game:"

> Christopher and I were talking about the standards before the class started. He was telling me that he was getting in trouble for talking negatively about the standards. He said he doesn't care, because he only has three more years until he is retired. He has his lesson plans hung up behind his desk on the bulletin. The standards book is on his desk. He said he can play the game and he added the standards' numbers to the objectives that were already on the board. (Christopher Thomas Observation, Y3, #1, p. 1)

The negative attitude that characterized the relationship between the principal and her staff was similarly apparent in many of the student-teacher interactions that observers witnessed. Rockford teachers seemed to have low academic expectations for their students. Observers frequently heard teachers making comments about their students' lack of motivation: "They don't read" (Evan Longman, Y1, #1, p. 12) and "This is not a good class" (Teacher Observation, Y1, #11, p. 21). Additionally, teachers frequently communicated their negative feelings about the students to the students; teacher observations were littered with negative teacher feedback. Comments such as "I am really disappointed in your behavior today" (Evan Longman, Y1, #1, p. 14) were common, as was the issuance of directives to students: "Sit down and copy the objectives" (Teacher Observation, Y1, #11, p. 1). The pervading attitude toward the students seemed to be one of resignation. Teachers seemed to have determined that they were working with a population that was destined to failure:

> Mr. Longman comes over to where I am sitting at the side table. He does not sit down with me but bends over and says in a very low voice, "This class is at-risk. Mrs. Dodge gave them to me, probably because no one else wanted them. I get along with them just fine." He continues, "The stories these kids tell would straighten your hair." The boy nearest us starts laughing. Mr. Longman turns to him and says, "Isn't that right, Bob?" Bob replies, "Yup. Me and my friends, mostly we've been in jail lots." Mr. Longman turns back to me. I had the impression that he expected me to be shocked or make some remark because he looked at me very piercingly and waited about 30 seconds before continuing. He tells me that one girl is in and out of jail on a weekly basis. In fact, he says that most have been in jail or will be before the year is out. I inquire if these students are having academic trouble to which Mr. Longman laughs and tells me, "They're in and out of school so much, who knows what they can do?" (Field Notes, Y2, #1, p. 6)

Despite the often tense relationship between students and teachers, many teachers did make efforts to support their students in ways that extended beyond the classroom. One teacher described an after-school program that he had created to develop personal skills that were not emphasized by the state standards:

> We talked about how he takes three students every Monday to volunteer at another school to teach younger students how to play chess. He takes them after school and they sign in and get volunteer credit. He wondered why Dodge hasn't said anything to him about that. He said that the standards don't cover community service or respecting your classmates. He said the kids are learning so much from going to volunteer. They love teaching other kids what to do. Anyway, he said that last week he took them to dinner and they really enjoyed it. (John Faulkner Observation, Y3, #1, p. 1)

Another teacher described how she provided extra support for students who seemed to be struggling in her class. She set up individual lunch conferences to discuss problems that students were having that might have been affecting their school performance. Lunch

"works best because I can really show them and talk with them and it's a real calm type thing" (Angela Knight Interview, Y1, #12, p. 6).

But largely, teachers held low expectations of students and consequently believed that the often open-ended and complex nature of differentiated authentic assessments was too challenging for their students. One teacher commented that it was difficult to gear assessments toward specific student needs because, with her population of students, it was often difficult to ascertain at what level the students were really capable of performing. She believed her students' abilities were often masked by personal problems:

> Sometimes that's hard. Because if you have a student who on a particular assignment just doesn't try to do it because maybe something is wrong with them inside. We have a lot of personal problems. It's hard to individualize because you know that the student can do it, but you know also that the student is going through a lot. (Angela Knight Interview, Y1, #12, p. 6)

Like the teacher above, most of the teachers at Rockford were initially hesitant to use authentic assessments in their classrooms because of the belief that their students could not handle them. One grade-level team was particularly uncooperative, breaking appointments with coaches, giving traditional tests or quiet seatwork while coaches were scheduled to observe in their classrooms, or simply hiding from the coaches (Field Notes, Y3, #9, pp. 1-4). However, with consistent support from the coach, a few members of the two other grade-level teams were more cooperative, coming to meetings and using authentic assessments occasionally in their classrooms (Angela Knight Interview, Y1, #12, pp. 8-10).

In general, however, Rockford teachers were focused on presenting the factual information delineated in the standards and assessing student work through traditional methods (Teacher Observation, Y1, #2, pp. 10-16; Teacher Observation, Y1, #11, pp. 21-26; Teacher Observation, Y2, #2, pp. 3-15; Teacher Observation, Y3, #1, pp. 1-8), even when the methods conflicted with their personal beliefs about teaching and learning. One teacher described the standards as meaning

> That you tend to meet the needs of the state more than you do the needs of the child because you have to . . . . I don't know, I just think in middle school, we were taught years ago when we began middle schools that we need to focus on the child and the needs of the child. I think the standards are telling us to change our focus somewhere else. . . . Damn the torpedoes and full speed ahead. That's kind of what standards are telling us to do. (John Faulkner Interview, Y3, #1, p. 6)

Rockford teachers felt that the nature of teaching to the standards was antithetical to the middle school philosophy, but at the same time felt compelled to teach to them. Their frustration with this conflict was evident in their responses when asked what they thought of when they heard the word "curriculum." A team of teachers brainstormed the following list: "Standards, requirements, packed, too much, connections, not enough time, teacher left out in writing curriculum, rigid, prerequisite knowledge needs to be

addressed, always changing to fit the latest state mandated test, and trendy" (Field Notes, Y3, #10, pp. 1-2). While many teachers expressed the desire to use authentic assessments in their classroom and noted that they had often used alternatives to traditional test formats in their classrooms in the past, they felt that the pressure to teach the standards prevented them from doing so:

> We're still in many ways bound by the standards. And many times that takes away some of the things you do. In March—or February—I wanted to make hot air balloons with my honors classes. That was the one way I was really going to make things different for them in the wintertime. I was going to let them make their own hot air balloons. (John Faulkner Interview, Y2, #3, pp. 3-4)

For most teachers at Rockford, the study seemed to be viewed as interruptive of and antithetical to the purpose of preparing students for the state tests. One teacher spoke for an entire team, saying that, while the performance assessment tasks "were nice, they didn't match what they had to teach" (Field Notes, Y3, #9, p. 3). Another teacher said, "The only thing I worry about is the test format for the standards is different than on alternative assessment. So today's chapter 2 social studies test will be the standard fill-in-the-multiple-choice-dot-dot-dot test" (Angela Knight Interview, Y3, #1, p. 10). A pair of teachers clearly communicated their feelings about the intrusiveness of the study:

> Two older female teachers passed, eyed me curiously, and asked, "Are you the UVA person?" I introduced myself, and they commented that after lunch was not a good time to observe because the kids were so wound up. They asked about my observation schedule for the day, and then responded, "Good. Not us." (Field Notes, Y1, #1, p. 16)

Not surprisingly, the standards were a palpable presence in all classrooms at Rockford. Due to Rockford's inferior positioning in the city, the school felt immense pressure to teach to the standards and raise student test scores. Each classroom had the standards posted; one teacher had entered the standards onto her computer screen and they rolled by over and over, a symbol and a constant reminder to anyone visiting the classroom of the relentless prominence that the standards had acquired (Observer Exit Interview, Y3, #9, p. 4).

The importance that Dodge placed on teaching the standards and raising test scores is evident in an incident that occurred at the end of the study. Researchers requested that all students involved in the study take post-tests. Dodge assented, but surreptitiously told teachers to only send students who were identified as gifted to take the tests. Dodge also asked the teachers not to tell the researchers administering the tests that this was the case. Worried that doing this might affect the findings of the study, one of the participating teachers informed the site coach of Dodge's plan (K. Winchester, Personal Communication, February 2002).

As is obvious from the above incident, Sarah Dodge did not encourage her teachers to buy in to the study. Although she always provided coaches with open access

to classrooms, she never made a concerted attempt to understand the principles of authentic assessment. She made appearances at some staff development meetings, but never stayed for long and often missed them entirely. She told teachers that they did not have to try the suggested authentic assessments if they did not want to, and that they should just "deal with," or placate, coaches (Observer Exit Interview, Y3, #9, p. 10). She made very clear to the teachers that their primary responsibility was making sure students did well on state tests by providing them with experience in taking multiple choice tests. She underscored the low priority she gave to increasing her teachers' knowledge of authentic assessment by frequently breaking appointments with coaches without giving them any notice (Field Notes, Y3, #1, pp. 3-4). Dodge also made it very clear from the beginning that she did not trust the coaches (Field Notes, Y3, #1). One observer noted that Dodge's distrust may have stemmed from her belief that she was judged incompetent by central office and her fear that the study would affirm that judgment (K. Winchester, Personal Communication, February 2002). Dodge's resistance to the study may have been exacerbated by the fact that central office had given her an ultimatum to participate in the study in hopes of improving the quality of Rockford's teachers and raising test scores (K. Winchester, Personal Communication, February 2002).

Ironically, although little visible progress occurred in teachers' understanding or implementation of authentic assessments, Rockford was touted by the district superintendent as an expert school in terms of assessment practices. Rockford teachers were asked to train other teachers in other schools in the city to use authentic assessments in their classrooms (Observer Exit Interview, Y3, #9, p. 5).

Insight From Rockford

The first year and a half of the study was an unstable time for Rockford teachers and their coaches. During that time period, teachers were so resistant to the coaches (not answering questions that were asked or giving highly negative responses to particular coaches) that the study team tried a variety of different teacher/coach combinations to find workable relationships. Teachers regarded these frequent changes with wariness. They expressed the difficulty they were having developing a trusting working relationship with the string of coaches. Each new coach necessitated a "getting to know you" period, something that the teachers felt wasted their time. They were being asked the same questions repeatedly by different coaches. One teacher said, "It felt like, God, when is this ever going to end?" (Coach Exit Interview, Y3, #9, p. 15).

After the first year and a half, a single coach, Julia, was installed for the remainder of the study. Julia quickly became aware of how disgruntled the Rockford teachers were with the study. She was taken aback by the resistant and even hostile attitude with which she was greeted by the Rockford community. At the beginning of their first meeting together, a seventh grade teacher asked Julia, "Why should we give you any of our work or even work with you since we've never gotten anything of ours back?" Apparently, Rockford teachers believed that the work samples and tasks that they had turned in to the coaches had not been returned to them; the coaches who had received them had not only returned them, but returned them with feedback. They had kept copies

of the tasks as data samples, but had returned the originals (Field Notes, Y3, #1, p. 2). This misunderstanding led Rockford teachers to feel that the coaches, and, indeed, the study as a whole, was untrustworthy, disorganized, and did not have their best interests at heart. Because the principal at Rockford had no personal investment in the study, she did nothing to check or examine teachers' negative attitudes toward the study.

To rectify the situation, Julia immediately searched through the data files, made second copies of the data and returned to teachers what they perceived that they were missing. "After that, the doors were completely opened up," she said. She felt an immediate change in the way she was received in the school. Everyone was much more open and willing to see her (Coach Exit Interview, Y3, #9, p. 24).

Additionally, the Rockford teachers had been hesitant to work with the coaches preceding Julia because they felt that these coaches did not have enough teaching experience to understand what really occurred in the classroom (all but one of the coaches who had worked with Rockford teachers had had classroom experience). One teacher told Julia that he felt comfortable working with her because, "You understand the classroom, the kids, our jobs, and what's expected of us." Julia believed that her 11 years of classroom teaching experience allowed her to understand what it was like to work with a university on a project.

As the principal and teachers became comfortable with Julia, acceptance of and cooperation with the study increased. Although the relationship between the study and the teachers improved during this time period, not enough time was left to make up for the time lost during its rocky beginnings. It became quite clear from experiences at Rockford that, especially in the absence of a strong, well-respected administrator, a consistent coach trusted by the faculty is crucial. Teachers need on-going support and encouragement from someone they trust in order to take the difficult steps necessary toward changing both their teaching practices and beliefs about teaching.

Rockford Teachers

John Faulkner. John Faulkner was an experienced eighth grade science teacher at Rockford. Faulkner appeared to be highly comfortable with his students and to genuinely like them, feelings that were obviously reciprocated. Faulkner was very tolerant of noise and student activity, encouraged liveliness, and often engaged himself in playful banter with his students. While he certainly was not an authoritarian teacher, he was easily able to restore quiet and order to the classroom when necessary. A good deal of time seemed to be spent in Faulkner's class in good-natured repartee between teacher and students. When John was teaching his students, they were all engaged with what he was saying or engaged in the activities he had planned for them.

While Faulkner's classroom did not always reflect this, he spoke of the teacher's main responsibility as teaching to the individual child. On a personal level, Faulkner did recognize each student as an individual and cultivated unique relationships with each, but did little to plan curriculum that met each child where he or she was. Faulkner clearly

believed that the needs of advanced learners were met with the regular curriculum and took high grades as a sign of an appropriate match between a student and the curriculum. When Faulkner did provide extra challenge for advanced learners, it was through such traditional paths as adding projects or giving students more independence.

Faulkner was genuinely at ease in his classroom, most likely because of his enjoyment of his students and because of his high level of comfort with science. His knowledge of his content allowed him to feel comfortable abandoning teaching from the textbook (Faulkner Interview, Y3, #1, p. 7). Faulkner's confidence in the classroom also emerged from his feeling of ease at Rockford in general. He was highly respected by the principal, who "seldom ever bothers me about what is going on in my classroom" (Faulkner Interview, Y3, #6, p. 3). His sense of job security allowed him to take risks in the classroom, thereby enabling him to continue working on assessment strategies during the third year of the study when nearly all of the other participants in the school had given up because of the increased pressure of high-stakes testing. Indeed, Faulkner was one of the rare teachers who saw and could articulate the connection between authentic assessments, the standards, and good teaching (Faulkner Interview, Y3, #1, p. 5). He did not seem threatened by the standards, but seemed to somewhat begrudgingly accept them as "here to stay:"

> The standards represent our curriculum and I think it's just a new way of looking at the way things are done and the way we are being expected to teach. We are being held accountable for those standards so I think they are going to have to be our primary concern. There are things that are not good about it, but I can understand why that's the way it is. (Faulkner Interview, Y3, #1, p. 6)

Rather than argue against them, Faulkner tried to integrate the standards into his curriculum by teaching conceptually (Faulkner Interview, Y3, #1, p. 5). Faulkner felt strongly that the philosophy behind authentic assessment and the assessment strategies he had learned during his involvement in the study were valuable to his students, and was not willing to abandon them in order to teach to a standardized test. While Faulkner clearly grasped the concepts behind authentic assessment, he never fully implemented them. He did, however, begin to regularly use rubrics and consider multiple ways of assessing understanding: "I try to mix it up more now than ever. I have a variety of testing. Some testing like projects, like what you saw us present today, to authentic assessment where you get into more real-world products—I just try to mix it up as much as possible" (Faulkner Interview, Y3, #1, p. 3). He spoke of his involvement in the study as a "challenge" that he welcomed, and indicated that he was not threatened, but stimulated, by the changes that implementation of authentic assessment required him to make in his classroom (Faulkner Interview, Y3, #1, p. 7).

John Faulkner taught in a school in which pedagogical excellence was not rewarded—not by the administration and not by the other teachers. The culture of the school encouraged, instead, "getting by," and efforts to rise above the median set by other teachers were met with disapproval (Field Notes, Y2, #4, p. 7). Faulkner, with his natural intelligence and deep knowledge of his content, clearly had the skills necessary to be a

highly effective implementer of authentic assessments. His behavior in staff development meetings, however, indicated that he had no desire to "shine." He played the grown-up "class clown," making jokes and otherwise good-naturedly disrupting proceedings for the amusement of his colleagues (Field Notes, Y2, p. 2). Clearly, Faulkner recognized the importance of fitting into Rockford's social structure. What was most evident in Faulkner's classroom was that he was a potentially excellent teacher who had become lazy. He vacillated between fascinating his students with powerful learning experiences and wasting nearly entire class periods joking with students about the latest school sporting event, the latter being more the norm than the former. However, Faulkner's understanding of his subject matter was obvious, as was his understanding of authentic assessment. His half-hearted implementation of it spoke volumes about the influence that a culture of mediocrity can have upon a teacher. As the site coach said,

> I remember one time sitting down with him with this twinkie little "rubric" he had made—more of a checklist—it was a half sheet of paper listing what needed to be in the project and the points assigned to each. And I remember thinking, "John, I *know* you know this. So why are you giving me this?" It was so obvious that it was, "This is suiting my purposes, so this is all I'm going to do," for him. I remember I was always disappointed by him. (Observer/Coach Exit Interview, Y3, #9, p. 27)

Angela Knight. Angela Knight taught sixth grade U.S. History and Reading/ Language Arts at Rockford. Angela was a stern and traditional teacher who frequently raised her voice in class and issued non-negotiable commands to her students. For the most part, Angela demanded that students focus their attention on her, but, on one occasion, when faced with a particularly volatile student, Angela simply ignored her and allowed her to be disruptive. Angela later told the observer that she routinely ignored the student because she did not know what else to do with her. With this one exception, controlling student behavior was Angela's major concern in the classroom. It was where most of her energy and vocalization were spent, to the point where her scolding interfered with instruction. Her lectures were punctuated by "stop that," "sit still," and "quit talking," even when students were very focused and orderly.

She conducted class in either lecture or rapid-fire question-and-answer drills (utilized more as a form of providing students with information than as a form of assessing what students understood or needed to know). Her place was firmly at the front of the class. In none of the observed classes during years one and two of the study did Angela ever give students any independent or group work, although this changed slightly during the third year of the study. Knight clearly believed that teachers were the sole keepers of knowledge and students were passive receptacles of this information. Curiosity and desire to think seemed to be discouraged in her classroom. When students did ask uninvited questions of Knight, she usually told the students to be quiet or to ask the question later.

Knight did not seem comfortable with or knowledgeable about her content, particularly in language arts, which may explain why she was reluctant to allow for

student questioning. She routinely taught from the footnotes in her teachers' edition of the literature text and mispronounced students' vocabulary words. She was unwilling to try authentic assessments in language arts, claiming that they "wouldn't work" with that subject matter. She was much more willing to try them in social studies, with which she was more comfortable (although still not clearly knowledgeable as evidenced by her insistence, even when students questioned her, that Hitler was from "Australia").

Student products were not a major focal point of Angela's class. The walls of her room were covered in publisher-prepared materials. Only one small bulletin board located at the rear of the room displayed student work. Plastered across the center of the front board was a computer-generated banner that read, "I can PASS the [state] test." The positioning and general scarcity of student work indicated that it was not the primary priority in Angela's classroom; state testing was.

While most participating teachers showed the greatest amount of interest and commitment to the study in year two, Angela's buy-in came at the end of the study. Until the third year of the study, Angela frequently avoided contact with coaches, did not respond to e-mails, and never implemented any authentic assessments in class. During the third year, however, Angela became more invested in using authentic assessments. Angela's increased commitment to the study might have been in large part attributable to the fact that, during this year, she was receiving consistent support from a coach with whom she felt comfortable and had established rapport. She had also gone to a social studies conference where many sessions focused on performance assessment had validated what the study was attempting to do. At a school staff development session, she showed one researcher some handouts she had gotten from this conference (Field Notes, Y3, p. 2).

Angela then began to routinely use rubrics and to provide students with creative alternatives to pencil-and-paper tests, and indicated repeatedly that she saw the value of authentic assessments both for her students and for herself. She was enthusiastic about the tasks that she created. Angela showed both verbal and classroom evidence of understanding what authentic assessment entailed and the purpose of it and could verbalize (although her assessments showed no evidence of this understanding) the way the standards could fit into authentic assessment tasks. However, despite her enthusiasm for authentic assessments, she used them only as "creative" alternatives to traditional assessments. Nor did her classroom reflect a teacher who was using the results of assessments to guide further teaching. Additionally, Angela did not "trust" the results of the authentic assessments. She reported to an observer that sometimes the "wrong" students earned the best grades on them (that is, the students who got Cs or even lower on traditional assessments) (Field Notes, Y3, p. 3).

Angela's progress with authentic assessments was hindered by the low expectations she had for her students and her inability to give any control in the classroom over to them. The result was tasks that were unchallenging and limiting for most students. While Angela verbally recognized differences in her students' learning profiles and abilities, she did not know how to build basic skills in students who lacked

them or how to challenge students who were highly advanced. Angela recognized that one of her students, Robert, was clearly bored in her class and misbehaving because of it. However, she made no effort to adjust his assignments to keep him interested, even though she was aware that he was most engaged when, as she put it, she "makes it exciting" (Teacher Interview, Y2, #7, p. 4).

Marshall Middle School: Differentiated Authentic Assessment Treatment

Setting

Marshall Middle School was a medium-sized, suburban school in a city near the Mid-Atlantic coast. The school was located one block off a four-lane busy thoroughfare that ran through the middle of the tourist section of the town. Despite the close proximity to the traffic, the school had a rustic feel, situated on a several acre, park-like plat of land complete with nature trails and mature trees. Approximately 600 students attended Marshall in grades 6 through 8, a typical size for schools in the district. Marshall occupied an old building that was once a high school, although several renovations in the last two decades increased needed classroom and auxiliary space. The oldest part of the building was connected to the "annex" via a covered cement walkway. In the first year of the study, all students came from a middle- to upper-middle class section of the city. In the third year of the study, the city redistricted schools, which meant a shift in Marshall's student population. The school became bimodal, pulling students from affluent, predominately White, gated communities in the suburbs and from predominately African American, federally-funded housing communities from the city. The demographics of the school after the redistricting became roughly 45% African American, 40% Caucasian, and 15% Asian, Hispanic, and other cultural groups (Field Notes, Y3, #2, p. 1). Many teachers viewed students along socio-economic and color lines: presumptions of behavior, quality of work, and attitudes were surmised from the students' addresses and appearances. Frequently, teachers' presumptions at least reflected, if not contributed to, Marshall's reality—the most disruptive and struggling students were African American males that lived in the subsidized housing communities (Coach Exit Interview Y3, #10, pp. 7-8).

Marshall's climate was orderly, but emitted a lukewarm welcome to visitors. Individual teachers were more apt to greet visitors by name than the office staff, who tended to ignore visitors for several minutes before acknowledging them and directing them to sign-in books and name tags. Teachers, however, were friendly with adults and students alike and could be seen standing at their doors to greet children and supervise the hallways during class changes. Colorful, homemade-looking, fabric flags with teachers' names and a symbol for the team hung outside each teacher's classroom, further contributing to the warm hallway appearance and providing visitors and students with an in-house map. The walls of the corridors were filled with student work from every academic discipline, although the displayed pieces were largely worksheets—mostly identical, publisher-prepared materials—that contributed a symmetrical, uniform tone to the brightly colored bulletin board displays. The teaching force at Marshall was

predominantly stable (with the exception of some shifting at the time of redistricting and student reassignment) and most teachers had at least several years teaching experience.

At the time of the study, the school building had been recently renovated and the facility was stocked with extra amenities not seen at other middle schools in the district, such as a spacious library with current magazines and periodicals and an integrated technology system that linked the teacher's computer desktop to the television for easy class viewing of slide shows, charts, and text. The computer lab, complete with the latest computers and software, was always full of students, but the library's non-technological resources remained curiously underutilized (Field Notes, Y3, #2, p. 8).

Principal

Melina Wood, the principal at Marshall, was a short woman in her late forties, brisk and abrupt in manner, who always seemed to have something else to do besides participate actively in the study. Observer/coaches at Marshall frequently lamented her lack of availability for study-related consults and her absence at professional development sessions. When scheduled to speak at the opening session of an in-service in the first year of the study (a coach-initiated strategy to invite administrative involvement), she was absent, later citing off-campus meetings as the reason. Ms. Wood's hands-off approach was consistent across other principal duties, and as a result, Marshall's teachers generally did not regard Ms. Wood as a strong leader. In the absence of an instructional leader, the teachers assumed an independent role, making instructional decisions largely free of any administrative intervention.

Assistant principal Leonard Conroy picked up where Wood left off, representing the principal in study-related interviews, professional development appearances, and in scheduling necessary testing dates for the study. Mr. Conroy, a man in his early fifties, of average height and build, was hardworking and diligent. Additionally, he was assigned the primary responsibility of handling discipline issues, testing schedules, and administrative paperwork. Unofficially, he acted as a liaison between the teachers and the principal, supporting all teachers' efforts and providing needed resources. Prior to his appointment as the assistant principal at Marshall, Mr. Conroy served in a leadership position in the district's gifted program until a philosophical shift in the program occurred, leaving him at odds with the new leadership. At that time, Mr. Conroy decided to move into the assistant principal position at Marshall, hoping it would lead to his rapid appointment as principal in his own school. At the time of the study, a couple of years had elapsed since his move to Marshall, and no principal positions had yet been offered to him.

Two Teachers' Approaches

James Winston. James Winston was a tall, heavyset man in his fifties with short, graying hair and reading glasses perched high on his nose. Mr. Winston began the study with only 3 years teaching experience, beginning this new career after retiring from the military as a field scientist. He dressed professionally, wearing shirts and ties to school

every day. Based on his appearance and comments, he clearly believed teaching to be a professional job. Perhaps a remnant from his military career, Mr. Winston had a loud speaking voice, and communicated gruffly with the students in his classes. An observer/coach described his style with students as that of a military officer barking orders at enlisted soldiers, as demonstrated in the following classroom scenario.

> Student: Mr. Winston, do we have to report how much it weighs? I was absent yesterday.
>
> Winston: (not answering the student's question) You have everything you need. Okay . . . okay students, listen up. (pause) I told you the height of the drop yesterday. You'll need that to figure your kinetic energy. You should be able to figure how much potential energy your project has with height and weight.
>
> Students: (loud protests from many voices) No! You didn't tell us that!
>
> Winston: I put it on the board yesterday. If you missed it, too bad. (Students do not follow the on-going lecture, and continue to grumble aloud, protesting the lack of necessary information.) Listen! STOP! (shouting) If you didn't write it down yesterday, you've got PROBLEMS! (He returns to the board and continues lecturing over the students continued talking.) (Observation, Y3, #6, p. 1)

Not surprisingly, this approach proved ineffective with the adolescents in his eighth grade science classes.

Further contributing to the 'disconnect' between the teacher and students, he moved, spoke, and explained ideas slowly. This drowsy pace contributed to his ineffective management of the high-energy students in his class. Mr. Winston articulated the importance of designing assignments and activities that were directed toward developing a deep understanding of essential concepts. However, he struggled with developing these understandings in his students, partially because of his lack of classroom management skills. The students paid little attention to his directions and direct instruction, and did not understand what it was they were supposed to be learning. Despite his loud attempts to regain control over their chattering off-task voices, he seemed unbothered by and resigned to the nature of his classroom, where he spoke and students didn't listen. The result was a classroom where students spent most of their time confused, and Mr. Winston didn't attempt (or perhaps know how to begin) to clear up the confusion.

Another reason Winston's students may not have fully understood essential concepts in science was the teacher's shallow content knowledge and pedagogical skills. He seemed to lack a point or meaningful purpose for many of his assignments, rather selecting activities that would "keep 'em busy" (Observation, Y2, #3, p. 7). He sequenced tasks in an illogical order, and the flow of instruction did not reinforce key concepts and essential understandings. In fact, it was unclear whether Mr. Winston had even identified the key concepts and essential understandings in his own mind.

Winston's criteria for selection of instructional activities appeared to include easy access to materials, a degree of intrigue for students, and a match between the activity and the allotted 50-minute time slot.

> What I normally use—I use the textbook as my main resource and now that we have access to the Internet, I will see what I can find on the Internet that will fit right into it and try to incorporate everything into that lesson. Then, I want to put something in there to try and make it fun and interesting to the students. I know there's some things that they—I can sit them here and give them notes all day, but then they will get bored or whatever. So, I have got to do something to try and make it fun and keep it interesting for them. So, basically, that's what I think about when I am putting something together for them or putting a lesson plan together. (Winston Interview, Y1, #1, p. 2)

This haphazard instructional planning did not change throughout his three years of involvement in the study, which included direct coaching on the importance of alignment of assessment with instructional objectives and the use of differentiated authentic assessments. During an interview, Winston explained how he tried to align assessments with his instruction, curiously omitting any reference to instructional objectives and end goals. He seemed to plan and teach day by day, rather than developing a comprehensive plan for a unit. It appeared that Winston planned assessments after the unit was underway, often near the end of the unit, because his plans seemed to develop or change throughout the execution of a unit.

> When I look at the unit I am teaching, I try to come up with something [an assessment] . . . the kids keep talking about we need to do something fun and a lot of assessments . . . it is a little different for them and then we do a little bit more outside the classroom, outside the textbook, so I have to look at what I am doing at the time and try to come up with something that will go along with what we are talking about in class . . . . I will do a search, normally on the Internet prior to and see what there is or is there some other information out there that might be fun. (Winston Interview, Y3, #4, p. 3)

It was hard to determine whether the lack of control in the classroom was a cause or an effect of the lack of instructional planning. Student engagement was limited, despite Winston's frequent use of hands-on activities. Students seemed to recognize that the teacher was unable to engage them, and, as a result, they tuned him out. Winston transferred the power to students, allowing them, through their behavior, to dictate instruction. "I always give [the students] something written and then they won't read it [so now I don't give them written explanations]" (Winston Interview, Y3, #1, p. 5). Further, he explained that increased use of authentic assessments in his classroom depended on the behavior of his students.

> I would hope to try to gain more of the assessments, but like I said, a lot of it would depend on the mentality of the kids. If the kids are willing to go the extra mile and do the extra work I think I put more in. But then again, if their attitude

> is to the point where they just look at it as a game, I sort of cut it off. (Winston Interview, Y3, #4, p. 9)

From the beginning, Winston believed that he implemented assessments like the authentic assessments he heard about in professional development sessions and discussed with his coach, despite the fact that this was never validated through observations of his teaching or through interviews with students. "[On a scale of 1 to 10 for degree of implementation], I would say I am about a 5" (Interview, Y3, #4, p. 1). It appeared he believed anything hands-on, such as the laboratory experiments he pulled from the Internet, were authentic assessments. Where he acknowledged resistance was in his non-implementation of rubrics to guide the evaluation of students' work.

> . . . a lot of the things that they said do for the [study] I was pretty much doing anyway. I just didn't develop the rubrics for them. So the real big difference is to come up with a rubric for an activity than the way I was using it to assess. For the most part it was pretty much the same thing I was doing so it wasn't a really big change. (Winston Interview, Y3, #5, p. 1)

He described what he believed was an authentic assessment in the third year of the study, despite the fact that it was used for instruction, not assessment. He did not use a rubric to assess student responses to the task, feeling that rubrics were not a necessary component.

> I didn't have a rubric for it [performance task] but before they started on it I gave them my expectations . . . what was expected before they started on it. Basically, that is how I do all of them. I will give them those expectations and what is required and everything and go through everything with them prior to be beginning. Then we go from there. I think because it was the first one they thought it was . . . probably thought it was something they were doing to have fun or to kill time. Some of them took it seriously, others didn't. As a result, some didn't do as well as they should have. (Winston Interview, Y3, #4, p. 2)

When asked, he explained that criteria for evaluation were developed after the students responded to the task, thereby making use of a rubric impossible prior to students' completion of the work.

> I look at what we've done in class and whether it was something they should understand and that is what I base it [evaluation] on. Whether it is too hard I can't determine that until I've actually given it to them and they either start complaining or tell me that they can't do it. (Winston Interview, Y3, #4, p. 6)

Mr. Winston admitted that authentic assessment required time in planning and implementing, and he believed he did not have the time to spend on them.

> A lot of the performance objectives will take more than one class period to do and with four classes back to back you get halfway through it and then you have to stop in the middle, tear it down, restock, and get ready for the next class. The

> time factor is a big thing. Last year I was able to do more because I had the 90 minutes where I could run over. (Winston Interview, Y3, #4, p. 5)

He cited other reasons why performance assessments were not feasible for his teaching, including preparation for state tests, which he believed required students to complete mostly pencil-and-paper types of assessments.

> A lot of the assessments, the way where we talked about doing them, most of their tests and evaluations, for instance [state tests] basically they are pretty much written evaluations so I can't get away from that. Once they leave and get into high school and college they are still written and they have to take SATs and other exams that you can't get away from the written part. (Winston Interview, Y3, #4, pp. 1-2)

He also believed that he lacked the funding for necessary materials that were required for implementing authentic assessments.

> As far as other things, funding for some. A lot of things we can't get materials for the most part, at least for some of the things that we've done. Some of the things we'd like to do I guess they will have to wait until they hit high school before they would do it. For instance, when we talk about compounds and breaking down compounds, I try do little simple things with them. We break water down into its component parts. We can do a few small things, but we can't do the big elaborate experiments that they would like us to do. (Winston Interview, Y3, #4, p. 8)

He continued his explanation with concern about not having the required laboratory space needed to complete tasks.

> Mainly because of the set up of the classroom we are not equipped to do it [performance assessments], where they are at the high school. I think [the room] may have been a [lab] at one time, but we don't have all the . . . my particular room is not a real science room. (Winston Interview, Y3, #4, p. 8)

While Winston articulated the belief that he already implemented some authentic assessments, he was very quick to identify many prohibitive factors—all outside his sphere of influence—that he believed shifted the blame for non-implementation of authentic assessments away from his immediate power or control. It was not his fault that he could not implement authentic assessments.

Winston recognized the diversity of the students in his classes, but his general struggle with the content, students, and planning kept him from considering overt differentiation for the varied learners' needs. He explained that "high ability kids kept him going," (Field Notes, Y3, #3, p. 2) but then explained that he did nothing different for them as a result.

> Normally with those kids, I know who they are, but I don't do anything different because I try to mix up the groups so I don't have all the high ability kids in one particular group in hopes that the ones with the lower ability will rise to the occasion. (Winston Interview, Y3, #4, p. 4)

Winston used his high ability students to teach the others in the class, a feat the teacher could not effectively accomplish. Consequently, throughout the 3 year project, Winston never created authentic assessments, classroom activities, or incorporated varied materials that could support his struggling learners or challenge his bright learners.

Evelyn Johannes. Evelyn Johannes was a tall, stylish, blonde woman in her late forties. She taught many years in the elementary grades before moving to the middle school to teach sixth grade reading and writing approximately five years earlier. She most often wore bright colors and pastels that contributed to her sunny affect and positive disposition. She taught not for the money, but because she enjoyed the children, and felt a sense of pride in her hard work. She was a thoughtful, quiet woman, an active listener with adults and children alike. Her classroom environment was inviting and engaging. Many books and resources dotted the small classroom space, and student work was prominently displayed. It was evident that all things in Ms. Johannes' classroom had order and organization, but students moved freely about the classroom interacting with the materials, teacher, and each other. She was effective at managing groups of students, and classroom activities frequently included movement and productive student noise. Because of her elementary background, she was knowledgeable about teaching reading and writing. She used readers' theatre, literature circles, writers' workshop strategies, and managed simultaneous activities with ease. While it was not an official policy at Marshall, Ms. Johannes' team decided to ability group the students on the team based on reading and math achievement. The result was largely homogeneous class blocks, with some class reconfigurations throughout the year, based on individual students' performance. She recognized great diversity in the skills and readiness among her students, and she was proud of affirming all learners' attempts. She viewed sixth grade reading to be "wide open" with "no set curriculum" (Johannes Interview, Y2, #4, p. 5). With the exception of some mechanics, grammar, and literary devices that she covered through whatever reading selection she chose, she identified less pressure to cover specific content than many of the teachers bound by content-driven state tests. Despite the recognition of academic diversity, and complete discretion for text selection, she chose one novel at a time to use with all students in all sections of her class. Despite the many able readers in her classes, she extended many novel studies over the course of a 9-week grading period. She explained teaching diverse students with the metaphor of running to a goal.

> I tell my kids on the first day of school, we have a fence outside. If I line you up and say run to the fence, everybody will get there unless you just sit down and don't try. But everybody is going to get there at a different time. The important thing is that you get to the fence and enjoy the run as you go. (Johannes Interview, Y2, #4, p. 5)

In the second and third year of the study, Ms. Johannes worked with project staff to develop her own assessment tasks, judging the researcher-created tasks too difficult for her students. Most often, she created one level of the task and one rubric for all students. She believed she could challenge her wide range of learners with adjusted questions, tracked classes, and modified expectations for student work depending on the students' ability.

Lack of Challenging Opportunities for Bright Learners

Marshall Middle School, with its upscale resources and suburban feel, was home to many learners identified as gifted as well as many highly capable learners that did not bear an official label. The school subscribed to Renzulli's Enrichment Triad Model for gifted services, with the intent of having talented students flexibly revolving in and out of enrichment groups as needed. Teachers revealed that while shifting of students did occur early in the year, less flexible grouping and revolving of students occurred as the year progressed. Students were initially placed in teams with a wide range of student abilities, but individual teams, like Ms. Johannes' team, ability grouped within the team. The teachers spent the first few weeks of the year grouping the students into tracked classes based on reading and math levels: high, medium-high, medium-low, and low achieving students. These groupings remained constant throughout the year, with infrequent if any shifting of membership. Janice Abraham, the gifted education resource teacher assigned the task of creating enrichment experiences for revolving groups of students, was timid and easily overpowered by the classroom teachers. She expressed dismay about teachers' misunderstanding about the program's philosophy. Teachers nominated well-behaved students more than they nominated those in need of academic challenges. When she appeared at the door to retrieve students who should have been released to the resource room, Ms. Abraham was often told to reschedule because students—even the gifted—could not miss the valuable, regular classroom instruction. When students were permitted to participate in the gifted enrichment program, lessons focused on developing students' multiple intelligences through open-ended tasks. One observation of the gifted resource teacher found Ms. Abraham allowing students to solve math problems using any of Gardners' intelligences they preferred. Incorrect answers frequently resulted, leaving students confused about the initial objectives.

As a part of the treatment for the study, Marshall's teachers received training in authentic assessment followed by individual or small group coaching to focus in-service tenets to each specific teacher's grade level, subject area, and individual teaching style. Project staff worked alongside teachers to determine specific curricular areas of focus and to determine how best to assess mastery of the unit objectives. Following coaching sessions, Marshall teachers were given project-created authentic assessments and graduated rubrics, often tiered on multiple levels of complexity depending on the classroom context. Despite the fact that teachers were instrumental in the selection of the unit and standards to be included, the teachers believed that the project-created tasks were too challenging for even their brightest learners. Lydia Ellison, a teacher on Ms. Johannes' team explained,

> I will be honest with you, I do tone down those rubrics. A lot of times they are much too wordy even for our most highest [sic] ability students, they are just too wordy. [The students] are still concrete and not all that abstract and they need A, B, C, D, this is what you are going to do, this is how you attain it, and this is where you get. (Ellison Interview, Y3, #3, p. 1)

Teachers at Marshall were largely traditional, and believed that the instruction they delivered to students was solid and effective for preparing students for state tests. The wide range of students' academic diversity was acknowledged and articulated, but teachers did virtually nothing to address differing students' learning needs. In the cases of reluctance to allow students to attend gifted education programs and to select the highest tier of performance tasks, teachers actually reduced available opportunities for challenge.

CHAPTER 6: Discussion

Classrooms are as complex and multifaceted as the human organisms that both inhabit and shape them. It is not easy to bring about even a surface-level change in classroom practice. To aspire to deep and substantial change in the classroom requires unearthing and grappling with attitudes, beliefs (both overt and hidden), habits, and needs—all shaped by time and experience. The task is confounded because there are multiple players in the change process—teachers, administrators, coaches and other change agents, students, and parents involved—all with attitudes, beliefs, habits, and needs that may variously invite, resist, or subvert change.

The voluminous classroom data from this study yields insights into the intersecting views, needs, and perspectives of those involved in the process of moving toward classrooms that are responsive to academically diverse student populations in the middle grades. The brief essays that follow examine teacher beliefs about instruction (a term which we use to describe curricular decision-making, assessment, and the teaching process), evolution of teacher identity during the study, student perspectives on the classroom, the role of the school environment in this change initiative, and the role of the coach in the change process. Experience derived from this study suggests that substantial and durable change in the classroom is unlikely to occur apart from an understanding of and capacity to deal with these elements independently and in combination.

If we envision teachers' practices metaphorically as houses that they have designed and constructed, then what we ask teachers to do when we ask them to transform their classrooms through differentiation is to tear down walls, rip up floors, and rebuild their visions of themselves as architects of learning. This is not a comfortable process, nor is it neat or easy. It is particularly difficult to ask teachers to undertake this renovation when the house is populated by rotations of 30 students who need some sort of shelter during the renovation process. Such change requires, first of all, that a teacher recognize that the structure is ill-fitted for its inhabitants, that the walls are cracking, or that the floors are warped and worn bare. That is, it asks teachers to reconsider their visions of the ways in which students learn, the nature of curriculum, and the roles of the teacher and learner. When we consider that many teachers have been in the classroom for years, developing strategies for teaching in and managing their classrooms that they have seen "work," and have been receiving approval or even accolades for precisely what they are being asked to change, it is no wonder that so many doors are closed with varying degrees of courtesy in the faces of change agents.

And yet, despite the discomfort and difficulty of what we were asking teachers to do in adopting differentiation, several teachers did take us into their classrooms and begin the process of creating a new environment. Some simply added a plant; others tore down exterior walls. Their stories allow us insights into what prompts teacher change and how we can best facilitate it in the future.

Differentiated Instruction and Differentiated Performance Assessment: Perspectives on Teaching

Implementing differentiated instruction and differentiated assessment in the classroom requires a certain vision of students, teachers, and the learning process that lies in sharp contrast to more traditional views of teaching. The vision undergirding differentiation and performance assessments views the teacher as the catalyst of learning, but the student is assumed to be capable of new levels of knowledge and skill as well as of becoming central to the process of learning. Learning is viewed as occurring within the individual student based upon the intersection of the content and the child's own particular set of skills, abilities, learning preferences, interests, and experiences. In this view, learning and knowledge acquisition are regarded as highly individual processes, with varying outcomes and routes to outcomes for each learner. Student success is therefore defined—at least in part—according to the individual. Individual growth relative to a standard, in addition to student-to-student comparison, becomes the measure of student success. The role of the teacher in this vision is as a facilitator, one who provides students with opportunities to make sense of the content through the avenues that best fit their needs, one who recognizes that, ultimately, the assimilation of knowledge occurs within the individual learner. In this vision, students are in control of their learning, and are given this control (rather than left to either gain—or spin out of—control) by teachers who work to provide the amount of guidance and the entry point appropriate for each child.

In classrooms that are responsive to learner diversity, the teacher presents content through major concepts uniting the essential ideas of the discipline, organizing facts in a more "economical" and powerful way to facilitate student understanding. The teacher must have a clear vision at the outset of what students should know, understand, and be able to do at the end of a unit of study, and measure the acquisition of the content and skills in an authentic way. It requires varied uses of time, resources, and feedback from the teacher. Assessment must be on-going and curriculum and instruction should be adjusted in response to assessment findings. The goal in this vision is to maximize the capacity of each learner.

In a differentiated classroom, the student arrangement is highly mobile and flexible, including a variety of student groupings—from whole-class instruction to small groups to individual work—and students engaged in different tasks. This requires teachers to act as facilitators and managers rather than relying on frontal control. Learning occurs through conversation: conversations between students and the teacher, students and the curriculum, students and other students, and students and self.

Traditional Perspectives on Teaching

More traditional classrooms look and sound very different from the active, flexible classroom described above. A primary difference between the two is that differentiated classrooms are highly student-centered; in more traditional classrooms, the teacher, and not the student, is the focal point of the classroom's activity. In the

traditional view of teaching, the learner is a largely passive receptacle of knowledge, a vessel into which the knowledge constructed and held by the teacher is poured. Typically, this is accomplished through teacher "talk," the time that the teacher spends in front of the classroom, presenting "the" content through a single instructional approach, occasionally asking questions of the students to probe for understanding. Generally, regardless of individual ability, interest, or learning profile, all students are expected to do the same work at the same pace. Content is presented through individual, isolated facts that must be "covered" according to a certain timetable.

The instructional styles of most of the teachers with whom we worked during the study revealed at least a partial grounding in traditional beliefs about teaching. Each classroom we entered revealed a different response to our invitation to change these beliefs. Some teachers eagerly accepted the challenge that differentiation of instruction and performance assessments presented. Others showed annoyance at being asked to alter their instructional and assessment practices. However, nearly all of our experiences with teachers, both positive and frustrating, revealed that traditional beliefs about the nature of teaching and learning present formidable barriers to instituting large-scale changes in schools.

Teachers' Visions of Teaching: The Undramatic Monologue

Angela stands at the door and asks the students to get their test papers ready.

"We have some slackers, so we'll go over the spelling homework first." She points her pen at a girl sitting in the back of the room. "April, throw the gum away." She returns her attention to the whole class. "You guys are into the fireballs. I am waiting to hear them go kerplunk. Get out the note cards."

Angela's voice fills the large, well-organized room, but students are slow to respond.

A student looks up and says, "I don't have them."

Angela sighs and rolls her eyes. "Did you have the list? The homework?"

Angela winds a slow path around the room with a green neon paper, asking each student if he or she has completed the homework. She thanks the students who do have their work and marks down the names of the five students who do not.

Angela begins the spelling test by calling out, "Number one!"

Two students still do not have their notebooks out. They scramble to get their paper, missing the first word.

"Wait!" one of them yells. Angela ignores him and looks down at her paper again.

"Number two. Delayed. Our flight was delayed due to weather."

A student calls out, "The date on the white board's wrong."

Angela looks at the date and back at the student.

"Okay—number four. I'm sorry—number three. What number were we on?"

Several students call out at once to give the words and the right numbers.

"Okay, hold on! Raise your hand if you have a comment."

A student asks for a pencil. Angela responds, "I don't have any pencils that are sharpened and ready to go. Here's a pen."

She takes a pen off of the overhead and hands it to the young man. As she does so, she leans down close to him and says, "You need to get your act together. You were tardy and now you are asking for materials."

The young man makes no response, nor does he seem fazed by Angela's admonition.

A young woman in the front row raises her hand.

Angela states in a loud voice, looking directly at the student with her hand raised, "If you have a question, you can ask me at the end of the test. Do it my way, not your way, Anne. Raise your hand if you have something to say AFTER the test—we're in the middle of a test."

Angela's frustration seems to grow as the test continues and several students ask questions about which number a word is and for words to be repeated. Angela's sharp tone and frequent scolding seem to have little effect on the students.

"Sarah, do I need to take your paper away?" she asks a student who has turned to her neighbor to ask a question.

"No."

"Then quit talking. Does anyone need any of these repeated? Make sure your name, date, and subject are on your paper like they are supposed to be or you will lose five points on your paper."

While Angela's classroom is an example of both the more rigid and more chaotic sorts of classes we observed, it provides a useful composite of the barriers to effective teaching and learning—and hence to effective differentiation—we encountered in many classrooms over the course of the study. It most likely comes as no surprise that in such

classrooms, teacher monologues, rather than student-directed conversations, were the standard fare. In most classrooms, observers noted that class time was largely comprised of teacher lecture, teacher direction-giving, and teacher attempts to redirect student attention onto the teacher. Student voices were generally only solicited (and often only tolerated) in response to teacher questioning. Quantitative findings from the teacher questionnaire supports what was observed in the classroom. The majority of teachers reported that they used lecture and direct instruction as the primary modes of delivering instruction.

Generally, little class time was spent in individual or small group work. Classroom observations indicated that when independent or small group work *were* incorporated, the majority of assigned tasks were the same for all students. This was supported by the quantitative findings from the teacher questionnaire. The majority of teachers reported that when students were configured into heterogeneous groups, they were usually working on the same assignments. The majority of teachers also reported that they never varied instructional materials for advanced learners, although they indicated that they were much more likely to do so for struggling learners. A large portion of teachers also indicated that they never used flexible grouping according to the learning styles, abilities, or interests of advanced students, although they reported being more likely to use flexible grouping with struggling learners.

Even when study teachers agreed to present differentiated lessons or use differentiated assessments, teachers frequently changed their plans at the last minute. Observers were often greeted at the door by teachers who made the disclaimer (which became a sort of plaintive refrain), "You're not going to see anything today." Teachers repeatedly explained that they had *intended* to present differentiated lessons, but an assembly, a school closing, a field trip, or a week of testing had interrupted their schedules and they felt forced to "rush through" content in order to be able to finish the year at the right place. When teachers did present differentiated lessons or use differentiated assessments, the majority of class time was devoted to the teacher giving detailed directions; even when teachers had planned lessons to give control over to students, they couldn't quite let go of the reins over the course of the study. Only a relative few presented successful differentiated lessons or assessments.

Nonetheless, few of the teachers participating in the study argued against the notions that students learn differently from one another, that students should have choices, or that students should be active participants in the learning process. Most teachers seemed excited about the possibilities offered by differentiated instruction and differentiated assessment. By and large, teachers felt that basing instruction and assessment on individual needs rather than gearing them toward the whole class resulted in greater opportunity for success for all students. As one study teacher articulated,

> You can reach all the kids in your class at a level where they can be successful yet challenged . . . you can carry the students a lot further than just with the traditional style of teaching where the teacher is directing everything that's going on at all times. (O'Leary Interview, Y2, #13, p. 8)

Most teachers also clearly recognized that attending to student differences was difficult and time-consuming to plan and implement, but felt that the struggle was worth it, both for the students and the teachers:

> It [differentiation] really means more effectively meeting the needs of individual students . . . it's a very challenging way to teach, but I think if we meet the students' needs we have to be challenged . . . but it is more rewarding for the students and therefore for the teacher to try and teach that way . . . . The benefits to students are clear. Differentiation is a way of designing instruction to meet the students' need for growth. If students don't show growth, then everybody has been wasting their time. (O'Leary Interview, Y2, #13, p. 9)

Some even spoke in glowing terms about the powers of differentiation. One teacher saw differentiation as a way of "empowering students" (Smith Interview, Y1, #13, p. 8). Another teacher compared differentiation to "teaching with the heart:"

> Because each student is treated in an individual manner, they are given tasks that call to the surface the best of their intelligences. You are looking at the best of what they have. If they are ever convinced that they can make it through anything, if they don't give up and they keeping putting out their best and you don't squelch that, then you have taught with your heart and you've never given up. I think that is probably the point of differentiation. (O'Leary Interview, Y3, #5, p. 9)

Teacher responses to the teacher questionnaire indicate that the majority of teachers believed that differentiation was worth the effort it required to plan differentiated lessons and assessments.

So why, then, were the dynamics of Angela's classroom—whole-class focus, teacher-directed activity, and restless students—more of the norm than highly engaging, varied, student-centered environments? Why were so few teachers successfully implementing differentiated instruction and differentiated assessment in their classrooms with any regularity? Why did so many teachers run away from or abandon innovations that they themselves felt were beneficial to students?

The gap between teachers' verbal enthusiasm for differentiated instruction and differentiated assessment and their scant use of them in the classroom indicates that changing teachers' practices involves much more than simply convincing them that an innovation is a "good idea," or even that it could have profound positive effects on student learning. Changing teachers' practices requires deconstructing an entire belief system about the nature of schooling. The change process inherently involves teachers in a struggle between their established beliefs about the nature of teaching and learning and new ones that challenge and frequently contradict these established beliefs. This struggle is often a highly uncomfortable process, as many teachers' senses of competence are based upon their old systems of beliefs and tried-and-true practices. Asking teachers to abandon these practices and beliefs is akin to asking them to abandon their professional identities.

Teachers' Beliefs

What is so evident in Angela's classroom, and in many of the classrooms we observed, is the deeply ingrained beliefs about students and teaching that many teachers share. Most individuals come to the teaching profession with certain visions of what "teaching" is and what an effective classroom looks like. These visions are derived from "the deep structure of schooling" (Tye, 1998), a pool of assumptions about what schools are and how they should function that have crept into our society's collective belief system. These widely held beliefs act as forces that squelch innovative efforts in an attempt to maintain the status quo. Often, deep structure beliefs are so ingrained in a society that teachers are not aware that these beliefs are subject to question, and yet they influence every decision a teacher makes in the classroom. Accordingly, innovations that stick are more likely than not consistent with the beliefs that underlie our society's "deep structure" of schooling. Without intense, long-term support, innovations that challenge those beliefs generally do not last much beyond the first blushes of excitement that their introductions engender (Tye, 1998). So what are some of the beliefs that compose teachers' deep structure, and that in so many cases blocked teachers from committing themselves whole-heartedly to implementing differentiated instruction and differentiated assessment in their classrooms?

While for purposes of analysis it is useful to separate teachers' deep structure beliefs into distinct categories, these beliefs are in many ways interconnected and overlapping.

Belief #1

Teaching is "talking." In movies, on television, and in general lore, our society's vision of a "good teacher" is that of an individual crusader, a person whose dedication, love of students, and hands-on devotion to learning transforms a classroom of misbehaving adolescents into serious students. The "good teacher" is the one who jumps onto desks to make Whitman come alive for snoring adolescents, whose tenacious personal tutoring forces the cognitive breakthrough that changes the life of a potential dropout. A good teacher is often portrayed as the only person who can help a troubled or struggling student, an image that penetrates teachers' conceptions of their roles and responsibilities in the classroom:

> I know a lot of my students in my heart. I know that I need—or somebody needs—to be with them doing this. Of course, when you are a teacher, you only feel like it's you that can do it. You know what I mean: "*I* know what she needs." And it's funny, because it's not true. They learned all this other stuff from other people when they got to you, anyway. But you take it like—"*I've* got to get her where she needs to be." (Gold Interview, Y2, #2, p. 4)

For most teachers participating in the study, the methods involved in "getting students where they need to be" reflected the beliefs about good teachers pervasive in our society. In this view, educating students requires the teacher to have direct and sustained contact

with all students—something that has traditionally been accomplished through front-of-the-room, whole-class instruction.

Even when confronted with other models of facilitating understanding, study teachers maintained the belief that "teaching" occurs only when the teacher delivers knowledge verbally to a group of students in a classroom. Teachers consistently indicated that "talking" was the defining quality of their job and a large part of their responsibilities as educators. In fact, as teachers attempted to shift toward more student-centered classrooms through incorporating more small group and independent work, many expressed guilt over not doing their job or "taking it easy."

> I feel like I'm just doing nothing. I feel like all I do is watch them and try to encourage this or that, but I just . . . I feel like I'm lazy. I feel like I'm getting paid just to watch them learn, you know, without really doing anything about it. (King Interview, Y2, #3, p. 12)

Another teacher expressed a similar view that "teaching" is equivalent to "direct instruction," a view reinforced by the parents of his students:

> I teach through direct instruction. It used to be, at my old school for instance, that we were told, "Now we don't want people up there teaching, because we told the parents of this school that we are on a new course, because children learn by getting together in groups and discussing things." That was one of the biggest decisions of my life, to say, "No, I'm not going to do that." And on Back to School day, last period I had parents come to me and say, "God, you are the first person we saw teach today." (Allen Interview, Y3, #4, p. 5)

It was difficult for teachers to abandon the belief that a teacher is only facilitating learning—only doing what she is paid to do—when she is at the front of the room passing along knowledge. Clearly, for many study teachers, feeling that the teacher's place was at the front of the room was not a power issue. Instead, it was driven by a sense of responsibility, a belief that all students need a great deal of direction in order to learn, direction that can only be given through teacher talk.

> It appears that Eric is uncomfortable letting go of student learning in the sense that nearly all of the instruction becomes teacher-directed. He said before class that today the students would figure out the lesson themselves, but then he spent most of the class going over it with students. Most students listened to what he explained rather than working ahead on their own. Eric got in the way of students working in groups, figuring out what they can do on their own. There are several students in this class who can move ahead much more quickly, but Eric is not yet ready to let them go very far. He feels very strongly that students need to be at about the same point at the close of working for a day or two. He did set up the three groupings today but then really reverted to whole-class instruction by doing the explanations and instruction at the board . . . he feels very responsible for

> students' learning and seems to feel that he is ultimately the one who controls their learning. (Daniels Field Notes/Observation, Y2, #1, pp. 9-10)

Eric's feeling of responsibility over student learning may explain why, in many of the classrooms we observed, individual or group work were much less common than whole-class, teacher-led instruction. While individual or small group work are not givens in all differentiation scenarios, teachers must be willing to provide flexible options for learning suited to students. As teachers discussed their practices, it became evident that, in general, participating teachers believed that independent work was appropriate for students to reinforce ideas and concepts, but new and crucial information needed to be first presented and explained by the teacher.

> Kids are supposed to learn from their reading. Which is fine, in theory. But again, I'm a strong believer in: I teach, I give the examples and generally, by and large, they still have a lot of reading and math to do from their books. Usually that is going back and reading into another facet of what I've already taught. In other words, I'm asking them to make a connection, rather than teach themselves. . . . I believe the students have to be taught skills before they use them. (Allen Interview, Y3, #2, p. 5)

Teachers repeatedly asserted that independent and group work more often than not resulted in wasted, or at least less productive, time than did teacher lecture and discussion: "I can't always count on them to get what I need them to get from independent activities and independent reading so as a result we all need to do it together" (Weston Interview, Y2, #2, p. 5). Because many teachers had these concerns about small group work and because many shared the misconception that differentiation of instruction meant arranging students in small groups all of the time, many felt uncertain as to how effective differentiation could be.

Central to teachers' concerns about individual and small group work is the issue of student understanding. Teachers had difficulty enacting the balance between "director" and "actor" that a student-centered classroom requires. Even when teachers recognized the benefits for students that came from working independently or in groups on tasks, they often doubted that students were "getting it" without continual direct teacher explanation and supervision. And while most teachers recognized that teacher "talk" was less engaging and interesting to students than working in groups, they still had doubts about students' abilities to learn on their own. Reflecting upon a small group activity that she had employed in her classroom, one teacher commented,

> When they're working in groups, they seem to enjoy themselves more than if I'm up front, you know, discussing . . . . But I don't know how it's going to be when it comes test time next week, to see if they know the elements of a folktale—what makes a folktale different than a myth. (Barnes Interview, Y2, #2, pp. 6-7)

Teachers' uncertainty about the value of varying whole-class instruction with other grouping options seemed to emanate not only out of their belief that teacher talk is a

necessary component of learning, but also out of another, related deep structure belief: that student silence is necessary to learning.

Belief #2

Student silence is a necessary part of learning. In most of the classrooms that were observed, certain assumptions about appropriate conditions for learning were evident. To facilitate the primary mode of knowledge transfer to students—teacher talk—teachers generally tried to maintain classrooms in which students were still and silent unless called upon, and interactions were limited to those between student and teacher. In general, on the teacher questionnaire, teachers reported never using learning centers, interest centers, or flexible grouping in their classrooms. Nearly all teachers reported that, in their classrooms, students worked in whole groups on the same seatwork on at least a weekly basis; a large portion of teachers reported that this occurred every day. Both quantitative and qualitative data indicate that, in these classrooms, student-to-student interaction was generally discouraged. Teachers know that this is the type of classroom environment that most parents and administrators expect to see. Quiet students indicate a successful, well-managed classroom. Both qualitative and quantitative findings indicate that the implications for a differentiated classroom, then, in which students are engaged in small group work, conversation between students is encouraged and often necessary, physical movement is likely, and the teacher is removed from center stage, are grim. Operating under traditional standards of "good teaching," many teachers mistakenly conceive of a differentiated classroom as confusing, hard-to-manage, and noisy.

While learning to differentiate, many teachers struggled with the desire to allow students freedom in their verbal interactions with one another on one hand, and uncertainty about how to ensure that productive learning was taking place on the other.

> I feel that I'm in a dichotomy or paradox within my own self a lot of times because I often have to battle with myself on this a lot. I often want it quiet. But I realize that to differentiate well, it's not going to be quiet and so it's like I battle with myself over this all the time because if the learning was taking place and I knew that it was, then I could feel good about it being noisy. But I find often that just more distraction is happening than learning. (Barnes Interview, Y2, #2, p. 6)

Managing a differentiated classroom requires teachers to employ different skills than those involved in managing whole-class instruction. Traditionally, classroom order has not been achieved through teaching students to take responsibility for their own learning. For many participating teachers, changing their classroom management routines was out of the question, as many felt that they had spent a lot of time developing successful—or at least comfortable—routines. And because teachers had difficulty reconciling their beliefs that a well-managed classroom required frontal control with the high level of student independence often involved in differentiation, they had a hard time conceiving how differentiation could "work."

Belief #3

Students need to be controlled. The typical middle school classroom contains approximately 30 students—often a few more than fit comfortably into the allotted space—with varying interests, strengths, and needs. It is no wonder that classroom management is of primary concern to most teachers or that, like Angela, teachers spend a good deal of class time attempting to control student behavior. The old adage, "Don't smile until Christmas," warns teachers to remain strict, severe, and unwavering until their classes are firmly under their control. Many teachers feel that until they have control of their classrooms, no true learning can occur. One study participant commented,

> My biggest challenge is classroom management and the low skills kids have. They don't do homework. They don't study for tests. I've worked so hard on classroom management and getting them to behave like young ladies and gentlemen, that maybe now we'll be able to get to the teaching. (O'Leary Interview, Y3, #5, p. 4)

Once teachers have established classroom management routines, they are reluctant to let them go or to alter them in any way. The result is that, often, teachers would rather sacrifice an innovation that seems appropriate than risk losing control of their classrooms. Unfortunately, narrow focus on discipline and frontal control in the classroom can interfere with student learning.

> Ms. Schroeder's energy seems to be so focused on maintaining student discipline and her position of authority that she has no time or desire to be reflective on effective classroom practices . . . basically, Schroeder hands out worksheets and texts and expects the students to learn the material in isolation. In other words, the students do not engage the subject matter in dialogue with their peers or teacher, and skills and content are presented in a drill-and-practice format. There is little evidence to suggest that Schroeder is planning activities and designing products that challenge the students and motivate them to interact with the material. Instead, she prides herself on rows of quiet students bent over desks, completing assigned tasks. Discipline is central to her view of teaching. (Schroeder Observation, Y2, #4, p. 5)

What may lie behind many teachers' fears of allowing students more freedom in the classroom is our society's perception of adolescents as "basically unruly creatures" (Tye, 1998). This perception contributes to the belief that students need to be kept constantly under control or they will, as one study teacher put it, "go berserk" (Sclafani Interview, Y2, #1, p. 2). Teachers who support differentiation in theory often claim that it "doesn't work" in practice due to student discipline issues:

> The level of self-discipline for some children is so low that in a class where the students who are low in basic skills, they won't do your alternative activities which is usually reading and responding to whatever is on their journal page for the day. Differentiation doesn't work because they won't work in the groups,

> often they are off-task. So when the numbers go up and the skill levels go down, probably that's the place where you need to differentiate the most, and it's the most difficult. (Jones Interview, Y2, #1, p. 2)

In classrooms populated mainly by struggling learners, teachers often dismiss the possibility of differentiating even before trying it out in the classroom.

> I have to refine or introduce behaviors that are not there, and that are required for a differentiated classroom. And I mean that in the realist sense, required. Otherwise it is a waste of effort when you are monitoring behavior and not allowing their brains to work. I am not sure that we can differentiate like we would want to. We can envision, but we can't actually do the application part of it until some of these gaps are filled in . . . . I really wish that I was in a gifted classroom and I could try this, because it is hard for me to do it in my room. (O'Leary Interview, Y3, #5, pp. 3-6)

Because of its emphasis on flexible grouping and student involvement in varying tasks, differentiation challenges teachers' visions of what "structure" in the classroom looks like—or how to achieve it in ways other than through frontal control. "Some of the classes need a lot of structure, otherwise the kids don't learn, they just spend all their time arguing with each other or talking and socializing when they need more structure" (Morgan Interview, Y2, #13, p. 8). Most teachers in the study did not know how to provide this "structure" in any environment other than whole-group instruction. Because teachers are expected to be authoritarians, "policemen of learning," both teachers and students grow dependent upon the teacher's eye in maintaining order.

> I don't know if it's sixth grade and immaturity, but there are some students that are not going to work unless they physically see you looking at them. With 35 in a class it's kind of hard to keep your eye on one particular student. One eye on that student, and one eye on the whole class. (Lindell Interview, Y3, #4, p. 2)

In general, teachers seemed to display a lack of trust that dynamic and appropriate individual or small group learning activities can result in purposeful engagement among students. Students, most seem to believe, must be controlled by the teacher.

Interestingly, we can learn a lot about what teachers do see as providing "structure" by looking at what they revert to once they feel their control in the classroom slipping away. Angela began her class by saying, "We have some slackers, so we'll go over the spelling homework first" (Knight Observation, Y2, #1, p. 1). Another teacher whispered to an observer prior to class, "I'm not sure if you'll see anything, because if they're bad, we'll do grammar" (Perkins Interview, Y2, #2, p. 1). In yet another classroom, a teacher threatened his students with individual worksheets—"the ones from the workbook" (Washington Observation, Y3, #2, p. 4)—if his students weren't quiet during a lab. Using boredom and student silence to "punish" students—and then expecting genuine learning and engagement from them—is a common and yet dangerous contract into which many students and their teachers tacitly enter. From the terms of this

"contract," students come to understand what is expected of them: perfunctory performance, obedience, and routinized participation. In order to "punish" the teacher, students underperform or are loud, uncooperative, and withdrawn. In this environment, learning becomes subject to the exchange of rewards and punishments between students and teachers, in which "learning" is the reward students give to teachers, and more interesting work and freedom are the rewards teachers give to students.

> Jonathan identified the project of his choice. However, because he had been sent out of the room earlier, Margaret told him he didn't get a choice. This angered the boy, to whom Margaret responded, "Right now I'm seeing a big baby. Make your decision right now. I can write an 'F' just as easily as I can write an 'A.' " Jonathan relented and accepted the teacher's choice. (O'Leary Observation, Y2, #7, p. 21)

Unfortunately, students and teachers often get caught in this cycle of exchanging punishments—a familiar struggle so apparent in Angela's classroom and revisited above—with very little promise for the occurrence of any genuine learning.

In classrooms in which teachers tried to use frontal control over students rather than attempting to facilitate order through engaging tasks, differentiated tasks were used less often and were less successful, as the students were unsure of how to handle their independence.

> Mrs. Weston demonstrates visually on the overhead transparency what she wants students to write on their papers almost every time she gives a direction. This seems to be quite helpful to students. I think it may also allow some to be inattentive, because they know she'll write down what they're to do. You can see evidence of that today. Students are supposed to be working on an independent, differentiated task, but most are trying to locate information in their notebooks. One student says she can't find her packet. Another student calls out that the packet is green. The boy in the front row says that he doesn't have a green packet. Mrs. Weston explains that some of the packets are white. Students continue to talk and search for their packets. At the end of the class period, students have barely begun work on their assignments. (Weston Observation, Y2, #1, pp. 2-3)

In Mrs. Weston's class, the students had become dependent on teacher direction and hesitated to make a move without her approval and explanation. Mrs. Weston became frustrated with independent work, because, as she put it, "They can't get the organization down enough to do things on their own. We waste too much time, and I feel like, 'okay, let's just do it all together' " (Weston Interview, Y2, #2, p. 3).

The same group of students that Mrs. Weston taught had Mr. Allen for science. However, Mr. Allen's approach to classroom management was to keep students continually busy, working on engaging tasks. In Mr. Allen's class, the same group of students who struggled to find materials in Mrs. Weston's class worked well independently and seem engaged, even engrossed, in their assignments.

> With a minimum of direction-giving, Mr. Allen explains the procedures for the day's lesson. There is productive noise as student pairs get to work to solve their problems. Mr. Allen begins immediately to talk with the pairs and offers suggestions when needed. He seems very good about not offering too much help and, in fact, usually answers a question with a question, challenging students to figure it out for themselves. Mr. Allen seems to know when it is best to probe and when to simply tell students what they need to know. All students are busy working on their tasks and intent on solving the problem. When I ask questions, they really don't want to be interrupted. However, two boys sitting near me are willing to talk to me about what they've done. They obviously understand the skills involved and what is expected and are happy with their progress. In general, there is a sense of "figuring it out" and most students seem very intrigued with doing so. Although there are many different small groups at work, Mr. Allen is very competent at keeping his eye on many students at a time. (Allen Field Notes/Observation, Y2, #3, p. 3)

Belief #4

Students who are getting good grades don't need differentiation. It might appear that differentiation was used less frequently in classrooms populated largely by struggling students than in advanced classes where behavior problems were generally less of an issue. However, while classroom management issues were cited less frequently by teachers of advanced classes as reasons not to differentiate, teachers nonetheless generally felt that differentiation was more important for struggling, rather than advanced, learners. Quantitative findings from the teacher questionnaire indicate that the majority of teachers reported never giving choices in terms of content, process, or product to advanced learners, while a large portion of teachers indicated giving choice to struggling learners at least monthly. A large portion of teachers indicated using differentiation techniques (flexible grouping, providing choice, providing interest, and learning centers) with much higher frequency for struggling learners than for advanced learners.

While teachers spoke often about the need to alter assignments for struggling learners, it was rare for teachers to recognize that advanced learners also needed adjustments. One math teacher, discussing a particularly advanced student, commented, "Sally is really quick. In class every day she's out in the hall reading because she's finished with what we are doing" (Calkins Interview, Y2, #2, p. 17). When the teacher was asked what she could do to differentiate for this student, she replied, "I don't get the impression that she wants to move on. What I see is that she likes to get finished so that she can read her book. So I don't think that giving her more abstract work is going to take her more time" (Calkins Interview, Y2, #2, p. 17). After this interview, every time that the observer sat in on this class, Sally was reading a book.

In a sixth grade math classroom, a researcher made the following observation:

> Alan completed an entire day's work in under seven minutes. During the rest of the class period, he appeared bored, staring out of the window and doodling on his paper. He finally reached down under his desk, pulled out a book, and quietly sat reading. No one mentioned it. No one spoke to him during the entire class period. When I inquired about him, Mr. Tucker simply told me that Alan "got it" all the time and needed little direction. (Tucker Observation, Y2, #1, p. 11)

The perception that advanced students were satisfied with the level of work that they were given was pervasive among participating teachers. Because students such as Alan and Sally were not disruptive and sat quietly reading while they waited for others to finish, their needs were not immediately apparent to teachers whose attention was focused on students more actively demanding attention. In fact, many teachers expressed the belief that advanced students were *resentful* of being given more difficult tasks and, when given choices as to the level of work they'd like to do, chose the easier ones:

> That's the thing I didn't like about the lesson that I am going to replan, because I let the students choose. There were some options that were easier than others and of course I didn't have the top five students go right for the harder situation. They chose the easiest. That was one thing I didn't like. (Allen Interview, Y2, #7, p. 7)

In general, even in advanced classes, expectations of student ability and student motivation were low.

> The groups I expected the most from produced the least . . . sometimes I feel like when you give them the freedom to do something else . . . they are just going to slap it together. It's almost like they can't, or maybe *I* can't motivate them to go above and beyond. (Pink Interview, Y2, #2, p. 7)

Teachers in both the differentiated instruction and differentiated assessment sites tended to underestimate the level of challenge appropriate for their students. Interestingly, even the most effective teachers routinely shot too low for their students.

> Today's lesson was differentiated in terms of tiering, but all levels need to be raised in terms of challenge . . . Jeff maintains that he knows the readiness or ability levels of his students well enough to assign them different activities and groups. In today's lesson he aimed too low for nearly everyone. It seems that the problem lies in differentiating and maintaining high levels at the same time. (Allen Observation, Y2, #5, p. 4)

In the differentiated instruction treatment sites, teachers were encouraged to create their own differentiated lessons. While many of the teacher-created lessons proved a welcome change to students, few provided any high-level challenge. Teachers seemed more inclined to differentiate activities according to student interests and learning styles rather than by academic readiness. This may be accounted for by the fact that while many study teachers indicated some familiarity with or training in addressing varying

learning styles, few mentioned any training in addressing different levels of academic readiness.

When reflecting upon the success of their differentiated lessons, teachers tended to comment on their usefulness in engaging students who typically lacked motivation, or on the lessons' usefulness in producing quality work from struggling students. Teachers seemed less concerned with how the lessons affected the more advanced students. As one sixth grade language arts teacher noted, "These kids are always with you anyway. The gifted kids will always get into the work, they just take it a step further anyway" (Tome Interview, Y2, #3, p. 4).

The lack of challenging differentiated instruction and differentiated assessment provided for advanced students was not simply a matter of teachers not being able to create high-end, challenging curriculum and assessments. Even when given pre-made differentiated assessments (created by coaches, specifically to meet their teachers' stated objectives), teachers in the performance assessment sites often adjusted them to make them less challenging. When asked why they did so, teachers said that they believed that many of their students could not handle them. They did not even provide the challenging assessment as an option for advanced students to tackle.

When considering the level of challenge appropriate for their students, teachers in the assessment sites tended to adjust assessments according to what they felt would be appropriate for the struggling learners in their classes, rather than by considering their advanced learners. A seventh grade social studies teacher told an observer that she had used one of the university's pre-made assessments in her classroom, but felt that she had to modify it for use with her students.

> We did some parts of it, you know, but there were some things in there that when I looked at it, there is no way my kids could do this. So I took out those parts, and the kids seemed to enjoy it and they did pretty well. A few didn't turn theirs in, but you know, that's going to happen with some kids every time. (Knight Interview, Y2, #2, pp. 6-7)

This was also true when coaches prepared differentiated lessons on topics being taught. Teachers consistently felt their students could not handle the work.

In many classrooms, the small percentage of students who did not complete homework, study for tests, know basic facts, or possess requisite skills caused teachers to view their classes as a whole as less able to handle challenging work than they generally were. Mrs. Wilkinson, a sixth grade language arts teacher, told an observer, "My biggest challenge is working with the low level skills the kids have. They don't know when to stop at a period when they decode, they aren't processing" (Rockford Observer Journal, Y2, #1, p. 11). While Mrs. Wilkinson perceived these reading difficulties as a whole-class problem, classroom observations did not support this statement. Only a few students demonstrated difficulty in reading aloud during the classes that the observer attended.

During the study, it became obvious that one of the biggest barriers to the provision of genuine challenge to advanced learners was the fact that teachers generally held low expectations for student achievement and student ability. Teachers could not remove from their mindset the notion of basing instruction on the needs of the class as a whole. Teachers reported on the teacher questionnaire that consideration of the whole class as a single unit strongly influenced their instructional decision-making. Nearly all teachers reported using the general skill level and readiness level of the whole class as an important factor in determining the content they would teach. Observers noted that teachers' expectations for the whole class were determined by considering student weaknesses rather than considering student strengths. Additionally, most teachers did not seem to be aware of the fact that a well-designed, high-level task might result in greater learning for all students than rote repetition. As a result, advanced learners' classroom experiences were not particularly stimulating. An observer described a science classroom typical of advanced learners' experiences.

> One pair of boys who I had met during the standardized testing had finished their worksheet. [These two are in the accelerated math, taking geometry from an itinerant teacher. This teacher travels to the school to teach geometry to a total of eight students who completed algebra during the seventh grade.] These boys quietly got out materials from another class and diligently began working on that. Periodically, they would move the weight on the balance beam, appear to make entries on the lab worksheet and make a show of moving their graduated cylinder around. This was accomplished without their shifting attention from the work in their laps. Later on, they checked each other's work, gathered up their own, and packed it away. Then they joined in the general confusion, laughing with the boys seated behind them who were launching more projectiles from increasingly creative and complexly arranged launch mechanisms. (Dalton Observation, Y3, #4, p. 6)

Belief #5

Fairness and equity for students means everyone doing the same work. One of the greatest challenges that teachers participating in the study faced was trying to reconcile their own conceptions of equity with the conceptions of equity underlying differentiated instruction and differentiated assessment. From the standpoint of many teachers, equity can only be achieved through giving students the same work and measuring them according to the same standard. In differentiated instruction and differentiated assessment, equity is achieved through challenging individual students to move beyond the level at which they are currently comfortable, even if this means having different students work with different tasks.

Study teachers' apprehensions about giving different students different work stemmed primarily from concerns over affective and grading issues, as well as from concerns about the reactions of students to receiving "unequal" tasks. In most classrooms, discussions about differences in academic readiness were considered taboo. Only a few teachers felt comfortable discussing the philosophy behind differentiation

with their students; most others wanted to "hide" the rationale behind giving students different assignments. Teachers felt strongly that addressing differences in academic readiness through varying tasks created resentment in advanced learners and stigmatized struggling learners. One teacher commented on this belief:

> Some of the students have noticed differences in the tests. They always compare answers after they receive papers back—no matter what is said, most students want the easiest way out and resent it if they feel they did not receive it. (Sclafani Journal, Y2, #3, p. 1)

Because teachers were hesitant to raise discussion about differences in academic readiness, they were unsure about how to handle student complaints about fairness.

> I would hand out the assignments and people would look around and go, "Why are they doing easier assignments and why are they doing harder assignments and why are they doing different assignments?" and try to explain that to the kids. It was very tricky. I try to be very diplomatic but I find that's something I struggle with. (Wyatt Interview, Y2, #2, p. 3)

Most teachers felt that even when differentiating instruction and assessment, all students' tasks should "look" the same to prevent students from noticing the differences between their work and others' work.

> If students look over and the paper that they see looks a lot easier, that is another problem I have. I know it is all supposed to look the same—just looking at the table, the papers are supposed to look similar. It is very difficult to make plans when you have one child reading on a grade two or three level and another child . . . . In fact, I have a boy who is reading past high school. Now you know his paper is not going to look like a child who is reading on a grade two or three. I don't care how pretty you make that paper look. Fortunately, he is one of the students who works, but they will say, "Why does Johnny's paper look easier than mine? I want his paper." Well, then there is Johnny sitting there looking embarrassed and then you are going, "I should have done that differently." They are children and they are very observant . . . the difficulty comes in when trying to find material that you can vary from grade to grade. That is where my problem comes in. As I said, I can't seem to make the grade two level look like a grade ten. (Lindell, Y3, #4, pp. 3-6)

Generally, teachers indicated that they feared that struggling students would be ridiculed for doing "easier" tasks.

> Just because you're smart doesn't mean that you are a nice person. It doesn't mean that you are going to reach down and help another person. We are dealing with children. Maybe as an adult you might reach back and try to pull someone else up, but I have had to discipline the smarter children who would say, "But Betsy can't read!" Well, you know they are rude and you can discipline them, but once

> they say it, it's a hurtful thing. They are children and are going to say ugly things. They are going to whisper loud enough for the other students to hear. (Lindell Interview, Y3, #4, p. 5)

Grading issues also made teachers hesitant to vary tasks from student to student. Assessing students on differentiated tasks and assessments challenges the traditional grading system, in which students are compared against one another on equal and identical measures. Many teachers seemed unable to relinquish this traditional vision of grading: "I have a real problem as a teacher, giving a grade for two tasks that I don't see equal in my eyes" (Faye Interview, Y2, #5, p. 8).

While some teachers could envision assessing students according to individual growth rather than in comparison to one another, concern about parent reaction prevented them from putting these beliefs into practice:

> We've got very vocal parents around here. They would not like their child not to get a 99 if they saw someone else getting a 99 for work and their child is having harder work—what they consider hard work—it's hard to explain. But the barriers, I think, are the grading barriers, and until we change the way that students are graded and do it more on "this is where you are, and this is how much you grew during the grading time" instead of giving As and Bs or 60s and 70s, I think that's the biggest barrier. (Sclafani Interview, Y2, #1, p. 5)

As a result, few teachers differentiated according to readiness and instead chose to vary tasks according to student interest and learning profile. As long as the tasks appeared to be "equal" in terms of difficulty, teachers felt comfortable varying student work.

Whether consciously or not, teachers returned to their original paradigm of teaching when under stress, facing time constraints, or feeling a loss of control. At the same time that teachers were articulating their concerns about the feasibility of using differentiated instruction and differentiated assessment in their classrooms, many of these same teachers were tentatively experimenting with them. Returning to the metaphor of teachers' beliefs and practices as houses that they design and construct, some teachers did begin the slow process of renovation. Over the course of the study, several participating teachers took small, tentative steps toward integrating differentiated instruction and differentiated assessment into their classrooms, allowing students choices in sense-making activities and assessments. A few teachers took broader strides, basing instruction on the results of pre-assessments or tying units together conceptually. While no teacher routinely used either differentiated instruction or differentiated assessment in his or her classroom, many at least began articulating the need to attend to student diversity in the classroom. Taking into consideration the large class sizes, broad range of learners, large number of responsibilities outside of the classroom, and time constraints which most study teachers faced, even the smallest of steps toward addressing academic diversity in the classroom is commendable.

Interestingly, many of the greatest success stories came out of the second year of the study. In this year, invested teachers seemed to be building confidence in their abilities to differentiate instruction and use differentiated assessments and were willing to take the risks in their classroom that using these methods entail.

However, during the third year of the study, many of the most promising teachers' implementation dropped dramatically. One of the study states transitioned into a high-stakes testing environment. Teachers were pressured to devote class time to teaching test-taking skills, and were given long lists of standards to cover in a prescribed scope and sequence. Teachers were under immense pressure to cover a large amount of material in a short period of time. Feeling forced to consider "coverage" over depth, many teachers abandoned differentiated instruction and differentiated assessment and returned to their previous methods of teaching. In classrooms in which teachers had begun to incorporate more independent exploration into topics of student interest, observers saw teachers reverting to whole-class instruction. In interviews, distressed teachers revealed that they felt that their ability to experiment or allow students to explore topics in great depth was limited by the large amount of content that they were expected to teach. As a result, many felt they could differentiate only after they had "gotten through" the content they were mandated to teach.

> I've gone through the whole year and written down everything we are doing everyday from now until June 5th and there is so much I have to cram in there. It's almost easier for me to say okay, this is what we're doing this day and this is it. It feels like there is not a whole lot of room for experimenting left . . . I haven't taught science in I don't even know how long . . . because of the tests. So, I have just been speeding through math like a crazy person. And we only have, after this week, three weeks of school. In those three weeks, I think I am teaching science four days. And it's just—I'm trying to figure out what are the neatest things I can do to get the most across and what that's going to be. (Calkins Interview, Y2, #6, p. 9)

Sadly, most teachers also felt that only after the prescribed curriculum had been covered could they attend to the needs of the high-end students, going into the depth that they knew their advanced learners craved.

> In science, I follow the curriculum . . . but, you know, after I cover everything, it's nice, especially with GT students, having the extra time after the basics have been taught to do some projects, Hyperstudio projects and work in technology, the Internet, you know, things like that (Allen Interview, Y2, #3, p. 4).

Unfortunately for many advanced learners, teachers found themselves rushing up to the last day trying to fit in the prescribed curriculum, leaving no time for more in-depth exploration of topics of interest.

> I am definitely driven by the curriculum guide—I am driven by the state testing and requirements and it's not that I've never used those before, I did. But I felt

> that I could pace things—I could give students more time to delve—and that type of thing and we could really—we could have more time to do enriching things without feeling like, oh gosh, I've got to move on, I can't stop for this—and this year I definitely do feel very—I feel very—I feel very frustrated—I feel very bound by different things. I just don't feel like they're having the opportunity to really get a good grip on things before I have to move on—and I'm not—I don't assess everything by test, I have a variety of assessments—but unfortunately it's the research type of assessments I like to use and so forth that are getting curtailed. (McKnight Interview, Y3, #4, p. 2)

A majority of teachers reported on the teacher questionnaire that their own openness to risk had a strong influence on their willingness to try new practices. In the end, differentiated instruction and differentiated assessment were used only when teachers felt comfortable taking risks. Time pressures, testing considerations, and student behavior concerns forced many teachers who were beginning to experiment with differentiation to retreat to old ways of teaching.

The fact that we saw few significant changes in teachers' practices over the course of the study despite the fact that many teachers were supportive of differentiated instruction and differentiated assessment is a testament to the difficulties inherent in the change process. Despite teachers' best intentions, the realities of school often make changing their practices extremely difficult. The multitude of responsibilities that teachers have, the large number of students for whom they are responsible, and the pressure of teaching large amounts of content to prepare students for state tests often understandably supercede a teacher's desire to try new things in the classroom. When carrying such a heavy and precarious load, finding time for the reflection and experimentation necessary to adopting change is exceedingly difficult.

Voices From the Back of the Room: Students' Perceptions of the Middle School Experience

Teachers in this study seemed to recognize the academic diversity of students in their classes, even if they seemed unclear about how to begin to address their varied learning needs. Likewise, students in the middle school classrooms in this study also seemed to recognize the differences among learners' preferences. "[Students in my classes] certainly do not learn the same way I do. I'm sure some of them like group related activities and more hands-on oriented. I personally do not" (Student Interview, Y3, #1, p. 6). Others concurred, emphasizing the differences in students' interests and motivation to learn.

> Some of the other ones they don't really want to learn. They don't even pay attention to the teacher. It's probably because they either don't like that subject or they just don't like how the teacher teaches or something. (Student interview, Y3, #4, p. 9-10)

Still other students incorporated educational language for the differences among learners, possibly in response to metacognitive teachers.

> I think the kids in my class vary with their learning styles. Some of them like visual learning, some like to write, some of them like to listen to the teacher talking. My reading teacher told me I have a very unique style of learning. I am not sure what that means. (Student Interview, Y3, #10, p. 5)

Regardless of the school, setting, treatment, or grade level, middle school students echoed the belief that they preferred and required different types of learning experiences in order to successfully access and integrate new content. "I don't think like everyone does. I think everyone has a unique way of learning" (Student Interview, Y3, #7, p. 7).

In addition to this common theme, repeated interviews with approximately 40 targeted students (representing a range of achievement levels, cultural and socio-economic groups, and grade levels) over the study period yielded patterns of similarities of the middle school experience which provide additional insights about the role of teacher, the nature of learning, and students' perceptions of schooling. Three major themes of student responses emerge and are described: students' perceptions of learning in the middle school, students' perceptions of testing and its impact on classroom activities, and students' perceptions of the role of the teacher.

Students' Perceptions of Learning in the Middle School

Students across all schools described classrooms incompatible with addressing their academic diversity. Verifying the kinds of classroom experiences seen in observations, students described situations where the teachers did most of the talking and students passively responded.

> You sit down and everybody is talking to each other until the bell rings. When the bell rings, he [teacher] shuts the door and you have to be quiet. He tells us what we are going to do for the rest of the day or the rest of the period. He gives us, like, say, the lesson plan and then he gives us the worksheet and we do that and turn it in. Occasionally, he will call out what you are missing and things like that. You have to do them and turn them in by the end of day. [Interviewer: Is it always like this?] Well, if we are watching a movie its all quiet and he makes us take notes on the movie and he always puts things up on the overhead and everybody is quiet and we have to copy what is on the overhead down on a sheet of paper. Other than that, it's pretty much the same: worksheets and copying notes. (Student Interview, Y3, #3, p. 5)

The quantitative findings from the students' responses on the content area surveys also support these students' voices. A large portion of students responded that teacher lecture and working alone on skills-related worksheets and tasks dominated their classrooms at least several days each week. Further, large numbers of students responded that working alone on assignments was more typical than working in groups. These

patterns of teacher-focused instructional tasks followed by individual practice seemed consistent across grade levels and content areas, and was supported by numerous classroom observations.

Often classroom experiences seemed to lack a meaningful instructional purpose, focused primarily on maintaining control of students' behaviors. A student described recent classroom activities, unsure of the purpose and benefit of the experience.

> Yesterday in social studies she [teacher] gave us a worksheet for the last two days [sic]. We had to do some words, fold the paper into four pieces and do some words, copy the definitions and then draw a picture of them. That helped us to . . . . I don't really know. (Student Interview, Y3, #13, p. 4)

Many students echoed this message, describing scenarios where students were unclear about the purpose and benefit of the learning experiences.

> Right now we are doing integers and I like that because sometimes I remember and sometimes I don't. But today I knew how, but we went over it and over it very much because tomorrow we are having a test. [Interviewer: Did it help you?] Somehow it must have. It didn't help me understand better, not me, probably some other people may have learned [something] but I already knew that. (Student Interview, Y3, #4, p. 8)

Other students described scenarios where they already felt competent with the concepts and skills covered in the class yet were given no alternative assignments or tasks. Students seemed to believe the teachers had purpose in their decisions and seemed confident that the tasks were beneficial to them even if they were unable to explain how. In the case of the math class on integers, the student knew the information but accepted the importance of the review because of the impending test. Common among adolescent respondents was the belief that despite the mismatch for some, classroom learning experiences must be appropriately targeted for others in the class. In short, students seemed convinced that teachers purposely planned activities and learning experiences, even if they personally experienced a mismatch.

The quantitative findings from the students' responses on the content area surveys supported these statements. The majority of students responded that all students in their classes worked on the same assignment using the same materials and were never allowed to skip assignments because they knew the materials. Further, a large portion of students responded that they were able to keep up with instruction and assignments in their classes and that a large amount of the content and skills taught in their classes had been previously studied.

Although teacher-directed, whole-group teaching was pervasive across all schools and treatments, there were some glimpses of more responsive teaching. Over the course of the study period, in varying schools, subject areas, and grade levels, some students described another way. Several students, notably in the third year of data collection,

recognized and described several ways that their teachers sought to address the range of student learners in the class. One student explained how her sixth grade language arts teacher responded to the heterogeneous grouping of students by providing choices, the use of personal dictionaries where students collected the words they personally needed to clarify, and different tasks for struggling learners.

> We have a lot of things going on in there. She tries to make sure that the people that might be unable to process one thing that we are doing have something else equally beneficial to them that they are doing. Yesterday we went into that class and we split into groups. For *Goody Hall*, we are reading *Goody Hall* by Natalie Babbitt, and we are keeping a journal on him with a little prompt for every chapter. Yesterday, we went in and she gave us ten minutes to read our leisure book or whatever we wanted to read. Then she picked a few of us to present what we wrote about the book and she gave us a long list of questions to pick from to write about. Like we had a choice. Like are there any characters that are like you or do you disagree with any of the characters' actions. After a few of us presented ours we all got our [personal] dictionaries (where students individually define unfamiliar words) and [copies of] *Goody Hall* and we worked a bit on that. (Student Interview, Y3, #11, p. 7)

Although different students completed different tasks in the classroom, the students neither questioned nor balked at the teacher's use of varied methods or providing choice. Contrasting teachers' fears about students being identified as different or rising issues of unfairness, this student interpreted the teacher's actions as a strategy to assist students of varying ability levels to be successful in the class.

While some scenarios of student choice emerged, it was not pervasive across all sites. The quantitative findings from the students' responses on the content area surveys portrayed a somewhat conflicting pattern. Students described classrooms where choice of topics or ways to process new ideas were seldom if ever offered to students. Further, students were rarely if ever given chances to propose their ideas for projects or class assignments.

Some learners saw less immediate classroom responses to students' diverse learning needs, but acknowledged eventual matches over time. A prominent notion among adolescent learners was the idea that if teachers provided a variety of learning experiences over time, they would eventually reach all students' preferred learning modes. On any given day, it appeared as if teachers prepared whole-class activities, with little modifications within any given class. However, over the span of the school year, students recognized the use of diverse instructional approaches. An eighth grade student explained how such a rotation of activities eventually reached all learners in the class. "Most teachers try to mix up the assignments, do different things so that everybody eventually gets a chance to do what they want to do." (Student Interview, Y3, #2, p. 6).

Other students seemed able to visualize potential alternatives to "one size fits all teaching," the most common scenario in the middle school classroom, although these

alternatives were not actually implemented. Without using specific terminology, one eighth grade student suggested compacting students out of already-mastered content in the textbook, then investing the most time in issues of greater importance and interest to the students.

> What I would try to do is get through the class book as quickly as we could in the year and if we found a subject that was relevant to current issues we would stop and talk about that. If we finish the book early, we could go into more depth about areas that they didn't do so well in or on areas that particularly interest some of us. (Student Interview, Y3, #1, p. 9)

Although this student was not trained in educational approaches and strategies, he was able to conjecture that such a design might match his needs and interests. Interestingly, students' clever ideas and solutions were rarely, if ever, tapped by teachers.

> I wouldn't give [teachers] advice at all. Because I've done that before. I've given a teacher advice and they yell back at me, like, "I don't need your advice because I'm a teacher and I'm telling you. You are not teaching me." (Student Interview, Y3, #3, p. 9)

Students' Perceptions of Testing and Their Impact on Classroom Activities

From students' perspectives, testing was an influential force in middle school classrooms. In particular, students from states with the high-stakes testing programs discussed the influence of the state tests on classrooms, and seemed resigned to an educational experience driven by preparation for end-of-year tests. An eighth grade student from one high-stakes testing state described his feelings about testing, revealing how his passion for writing had diminished because of repetitive formulaic writing experiences in class.

> It's not my favorite part anymore . . . I don't like [state test] writing. I think we have to follow it too verbatim in the classroom. It's kind of a drill that gets encrusted into you and on the other hand I [used to] like writing. (Student Interview, Y3, #1, pp. 1-2)

Across all schools, but especially in the high-stakes testing sites, class work in all academic areas mimicked the end-of-grade test. Classroom experiences seemed to focus on preparing students to take tests.

> For the first ten minutes we do some lessons of Latin prefixes and then we go on to [state test] skills. [Interviewer: State test skills, what are those?] Ms. Patterson explains how to do this worksheet and then she tells you what to do and she gives you another one for homework and you are expected to do that and try your best. (Student Interview, Y3, #13, p. 3)

Students' responses on the content area surveys supported these patterns. Students expressed overwhelming belief that teachers teach so that students can pass the end of unit or chapter tests and so that students will score well on standardized tests. These responses were consistent across grade level and content areas for all responding students.

Bright students forced to spend class time on state testing preparation and activities mimicking test formats seemed particularly resentful of the narrow instructional focus.

> [My advice to teachers is] to challenge them [the students] more. I would probably find things that each kid was probably not maybe as good at and target those and that would help. In classes like mine, [the state test] is super easy. I don't even think our classes should be based on that. At least the honors classes, because it is a joke . . . . We don't spend nearly as much time on [state testing preparation] as the regular classes do. We still spend time on it. Oh yes, it's a joke. (Student Interview, Y3, #2, p. 7)

Bright students consistently expressed negative feelings about the state tests, irritated that despite their seeming proficiency with test-related skills, teachers still emphasized state tests over other areas of need or interest.

Students' Perceptions of the Role of the Teacher

Students in this study believed that the role of the teacher was to plan instructional activities, make personal connections with students, but most importantly, to manage student behavior. "Teachers expect us students to behave and listen to them and do as they are told to do" (Student Interview, Y3, #7, p. 1). Many students seemed frustrated by disruptive classrooms and described classroom experiences where they perceived teachers were too lenient with students that did not complete assignments or behaved inappropriately. "I would give them [the students] more work . . . if they don't answer it or they goofed off, I would do something about it" (Student Interview, Y3, #3, p. 10).

Many students seemed to express their belief that the purpose of learning was to achieve high grades on report cards and tests. "I am sure that kids like learning if they want to make 100%s on their quizzes" (Student Interview, Y3, #6, p. 7). Other students echoed this belief, explaining that the role of a teacher is

> To teach kids and be sure they get the right grades for class and occasionally help them out when they need the help. If they are acting up and you are sick and tired of it just give them an infraction or something. (Student Interview, Y3, #3, p. 6)

Students seemed to believe that teachers were responsible for providing students with exposure to new ideas, new perspectives, and new learning.

> A teacher's job, in my mind, is to try to give the student a feel for different subjects within the class that they are teaching and to maybe build upon some of the ones they already have from previous grade levels. (Student Interview, Y3, #3, p. 18)

More than connections with academic subject matter, other students seemed to believe that the role of the teacher in the middle school was to connect personally with the students. "Ms. Douglas is my favorite teacher because she understands me a lot more and she doesn't get upset with my questions. She doesn't get aggravated. Like if I don't understand . . . . Well, she understands me better, I guess" (Student Interview, Y3, #9, p. 2).

The themes that emerged from collective students' voices echoed and supported many of the patterns and trends from observations and interviews with teachers and students' survey responses. Students continued to describe classrooms dominated by teachers' voices and singular paths of teaching, learning, and assessing progress. Despite this, students seemed optimistic about teachers and middle school. Students seemed to believe that teachers possessed purposeful visions for students' learning and that mismatches were eventually corrected over time through a variety of activities, choices in the classroom, or in some cases, teachers' attempts at differentiation. The stories and experiences described by students lend additional insight into teachers' deeply held beliefs and assumptions about the nature of teaching and learning in middle schools.

Teacher Identity: Adaptation—Adoption of Innovations

Teachers bring to the classroom more than their beliefs about teaching and learning. They operate in the classroom with certain perceptions about themselves as teachers. Such beliefs and perceptions include where on the continuum of teaching expertise a teacher perceives herself/himself to be, their level of comfort with the assigned discipline, pedagogy, and classroom management, their definition of personal success (which allows them to tolerate ambiguity and chaos, goal-setting, reflection), and the role they play in their students' academic and social lives. Together, these beliefs formulate a teacher's practitioner identity. The visions that teachers have of themselves as practitioners profoundly affect the decisions they make in the classroom, as well as the decisions they make when facing initiatives that may or may not align with their beliefs about teaching and learning. What we found in working with the target teachers in this study is that the structure, strength, and type of teachers' identities influenced their willingness and ability to wrestle with the challenges presented by differentiation and performance assessment.

Four major categories of teacher responses to the invitation to change emerged from the analysis of the qualitative data. These categories were developed in response to patterns evident in the data of likenesses between teachers implementing differentiation and performance assessment at similar frequencies and levels of accuracy in their classrooms. Several points of analysis, derived from the inductive analysis of the raw

data, were considered in determining these categories. These points of analysis included the teachers' degree of involvement in the instructional change process (from resistant to fully involved and eager to participate), the teachers' practitioner identities (how they viewed themselves), the degree of accuracy and fidelity to the innovations as presented, the placement of attribution (or blame) for success and failure of the new instructional and assessment practices, and the teachers' level of reflectivity about their existing and developing beliefs and practices. Using these points of analysis, four categories of teachers' responses to change emerged. Using the metaphor of the house to describe their practitioners' identities, these categories were named: Resisters, Accessorizers, Redecorators, and Renovators. Before these categories are described in full and highlighted with quotes and vignettes of participating teachers, three points are made to clarify this model.

When asked to change their classroom practices, teachers—regardless of which treatment group—responded in similar ways. The two treatments were included in the study to determine whether the front door (differentiated instruction) or the back door (differentiated assessment) was the most effective and efficient pathway for teachers to learn how to address students' academic diversity. In reality, both treatments were focused on encouraging teachers to consider how students varied in terms of readiness, learning profiles, and interests despite the varied approaches that coaches employed to assist teachers in recognizing this. Consequently, for the description of this model, the treatment groups are collapsed, emphasizing their similar responses, rather than duplicating the patterns in describing their responses to each treatment (differentiated instruction and differentiated performance assessment).

The categories described in this model emerged inductively from the qualitative data using a grounded theory approach to data analysis. While the researchers were familiar with the literature of educational change, the model was rooted firmly in the data of the project.

Changing beliefs and practices is a fluid process, and the teachers in this study moved fluidly among the categories described in response to a variety of triggers. The numbers of teachers in any given category were difficult to determine, and were, in most instances, unequal. At various times, teachers seemed to fit the attributes of more than one category.

The model describes patterns of teachers' actual responses, and is not intended to be predictive of all teachers' future experiences. The categories are descriptive of the teachers' responses to the invitation to change, and have provisions for the complexities of the change process. These categories are not intended to be hierarchical or suggest that change follows predictable and anticipated stages from the beginning of their journey as they move toward expertise in responding to academic diversity in their classrooms.

Throughout each year of the study, instigated by a variety of different triggers, teachers shifted between categories, in several configurations. There were unequal

numbers of teachers in each of the categories, and at various times, more in between categories than firmly rooted in one category alone.

Teachers as Resisters

Resisters were those teachers who essentially refused to participate in the study. Resisters, by the nature of their limited willingness and cooperation, were difficult to capture in observation and interview data. At each of the schools, in varying degrees of frequency, resisters emerged. While the scenarios varied greatly, their refusal took distinct forms: overt resistance and covert resistance. Overt resistance was unmistakable: verbal dismissal of the project and the project's objectives. Overtly resistant teachers rescinded permission to be observed or interviewed, requested a shift off participating teams, and/or left the school and/or teaching profession. For these, the objectives or methods of the project were in stark conflict with their beliefs, actions, and/or personal interests and the teachers wanted no part of changing. The sixth grade team at Franklin Middle School in the first year of the study boycotted the project entirely, going to the principal and demanding to be moved off the target team of the project. The coach recounted a frustrating situation she encountered with Ms. Harper and Mrs. Finnegan, two sixth grade teachers on the boycotting team whose resistance was obvious:

> Mrs. Harper would not be engaged—I asked her if she had found any of the math materials interesting and appropriate for her class—she rolled her eyes and said that the time it would take to implement and the activities would be difficult . . . throughout the rest of the session she sat with her arms folded across her chest. (Franklin Field Notes, Y1, #8, p. 8)

The coach wrote in her field notes that one sixth grade teacher on the same team was particularly vocal about her objections to taking on differentiated instruction.

> Mrs. Finnegan was immediately engaged in a fairly heated debate with [a central-office coordinator] about how WAS it that she was expected to do this extra work . . . . Mrs. Finnegan explained that she was taking graduate classes to be certified to be a school counselor—and that she certainly did not have the time to be keeping a journal and doing more work. (Franklin Field Notes, Y1, #8, p. 8-9)

The principal explained later that that team never asked to be part of the project, and she shouldered the blame for their resistance. Franklin's coach recognized a distinct difference in the level of professionalism, dedication, and commitment between the overtly resisting sixth grade team and the other participating teams at the school. There was one exception, Stan Johnson, the social studies teacher on the resisting team who privately met with the principal—risking backlash from the outspoken ringleader of the team—and asked to remain a part of the project.

> I kind of got into some things at the end of that [first] year that I wanted to continue and so because of the team that I was placed on, they were not too

> interested in continuing . . . so then since our team was kind of not really totally wanting to continue the program—well some were, but some were not, and so Ms. Shepard chose to change teams. So I went to Ms. Shepard and said I really liked a lot of things I learned last year. I was wondering what about the possibility of me continuing. So, luckily for me, she said I could. (Johnson Interview, Y3, #10, p. 1-2)

In the first two years of the study, Joan Borden at Langley Middle School acted as an overt resister. Her harsh tone of voice was unleashed during several professional development sessions, seeming to target particular coaches with stinging venom in response to the invitation to change. While she never restricted access to her classroom or refused to participate in large group professional development sessions, her body language and audible complaints clearly expressed her displeasure with the innovations. Observers continued to describe Borden's off-putting persona. "Ms. Borden had spines out about a foot from her body. She was battling off the universe pretty much as she went day to day" (Coach Exit Interview/Borden, Y3, #2, p. 45).

A second form of resistance, covert resistance, took many diverse forms, but each somehow communicated conflict between the teachers and the project's goals and/or methods. Some covert resisters demonstrated strong avoidance behavior (e.g., constantly scheduling conflicts preventing observations, interviews, or attendance at meetings). Others fabricated lengthy reasons and rationalizations about why deadlines couldn't be met, lessons executed, or assessments completed. A coach from Greene Middle School reflected in her journal about a covert resister, teacher Cathy Thiery.

> I was scheduled to interview Cathy from 9:00-9:30 today. This schedule had been given to teachers in September. She did not attend the meeting I arranged in September, she did not attend the workshop held in October . . . . She was absent in November when I visited. I have left notes, talked to the principal about teachers not coming to morning meetings, and send reminder messages to the school before each visit. This morning when I went to Mrs. Thiery's room, she was in the hallway. It was a bit before 9:00. I approached her and asked her if she remembered I was coming today (since she did not attend the morning meeting again today!) to interview her. She said that she did not, that this was her only planning period and she was very busy, then turned and walked away down the stairs. (Greene Field Notes, Y2, #1, p. 1)

A less emphatic covert resister, Merita Williams, permitted observations and interviews, but explained that she never implemented differentiation intentionally, but rather subconsciously and inadvertently.

> I believe I do differentiation every day in some form or fashion without even knowing it. Because I talked to my team leader and said, "Gina, is this it?" and she said, Merita, you do it every day and don't even know it. I am trying to think what did I do after that. It has slipped my mind. One thing that I did with [the topic of] industrialization as I always do with my groupings, to have them get into

> groups and discuss with one another to pull from one another. I don't know if that is really part of it . . . . I haven't done a tiered lesson or anything like that. (Teacher Interview, Y3, #5, p. 8)

Because she believed on some level that she was differentiating instruction, as affirmed by her team leader, she excused herself from exerting more effort or making more authentic attempts. Because Gina Lawson, her influential team leader, did not support Merita's attempts to change, her team leader convinced her that the need to change was unnecessary because she was already meeting student needs without even knowing it. Merita needed little persuading, and consequently became a covert resister of the project and its goals. A third covert resister, Leah Robbins at Langley Middle School, acted so slippery and inflexible with scheduling observations and interviews that the coach eventually dropped her from her schedule. The coach reflected about Leah's covert resistance.

> Leah was the most difficult person to observe for me. Leah was one of the four or five teachers that I tried to keep track of. Leah was the biggest disappearing act I've ever seen. I only was able to get in to see Leah's classroom maybe three times [over three years]. I stopped counting the number of times I dropped by to see if I could talk with her or inquire about something or follow up on something. There was always something else that Leah had to do. She was a [athletic] coach and she needed to go here and do this or she needed to go there and do that. Leah had some things that worked for her in the classroom and I didn't see an ounce of difference between when we came in and when I left. It is not to say that she isn't an effective teacher. I think her classroom is well managed and she liked kids and connected with them. But I never saw her try anything [to address academic diversity] . . . I think she was a capable young woman, I think she just bowed out of this project. She had some things that worked for her in the classroom, she already knew how to do all those things and I'm not sure she thought her learning curve needed to be challenged. If we just wait, this will go away. (Coach Exit Interview/Robbins, Y3, #2, pp. 15-16)

Teachers as Accessorizers

Accessorizers were teachers that were intermittently involved with project activities for a variety of motivations. For these teachers, interest in the project was not primarily to examine and change instructional practices, but for reasons of self-benefit: satisfying requirements, placating supervisors or coaches, and improving personal position by association with the project. These teachers seemed to believe that involvement, even tangential, would help them excel at "the game" of school. Accessorizers generally viewed themselves as highly competent teachers, experts in their field. Some were held up by their districts as model teachers, and were frequently asked to be mentors or to otherwise take on leadership positions in their teams or schools. These teachers generally possessed strong classroom management skills, and had classrooms that looked very impressive from the outside, or from a cursory view. These

classrooms were generally orderly and quiet, with students doing what they were instructed to do at all times.

Most of these teachers had a strong command of pedagogical "lingo," and were able to talk about the ways in which their classrooms reflected the latest innovations in teaching: multiple intelligences and cooperative learning among the most popular. Varying degrees of misunderstanding of the philosophy of differentiation and performance assessment became evident upon more prolonged investigation of the Accessorizers' classrooms.

Anne Armstrong, a sixth grade social studies teacher in a differentiation treatment site was able to accurately articulate a definition of differentiation. "To me, it is arranging my lessons, my expectations, my products, my tests around the varying needs and abilities of my students. It really involves looking at the students first and then making my plans" (Teacher Interview, Y3, #8, p. 1). She emerged as an early implementer in her school, and her principal identified her as successful at meeting the needs of all learners in her classes. In the third year of the study, he described her as a "master teacher" (Principal Interview, Y3, #8, p. 7). The following classroom scenario occurred in the third year of the study and revealed Armstrong's serious misunderstandings about the philosophy of addressing academic diversity, appropriate instructional methods to shift the philosophy into practice, and effective instruction in general.

Mrs. Armstrong stands at the front of the room and focuses the students to begin class.

> Armstrong: Boys and girls, eyes and ears on me. Remember, I told you that this year we are going to do different things sometimes. Well, today I am going to find out some information about how you read so I can figure out what to give you for homework. She reaches over to her neatly organized desk situated in the front corner of the room and lifts a stack of copied papers—two pages from their current novel, *Johnny Tremain*. She passes out the papers face down on their desks, continuing to talk to the attentive students.
>
> Armstrong: Since all sixth graders read differently, I want to see how this class reads. She reaches into her jacket pocket and pulls out a black stopwatch with a long string necklace she slips over her head.
>
> Armstrong: I am going to time your reading. When I say "go," you are to flip over your papers and read the pages as you normally would. When you finish, raise your hands so I can record the time it takes you to read. Any questions?
>
> Some students look around the room and smile at each other. Other students look intently at the stopwatch as Mrs. Armstrong adjusts the buttons. No students ask questions.

> Armstrong: Go! Students read, some tracking with their fingers along the print of the text, others sit forward in their chairs, intently focused as if running a race with their eyes. After only a few minutes of competitive silence, the first student raises his hand and announces completion.
>
> Student 1: "Finished!" Other students quickly pipe in and announce completion.
>
> Student 2: Done!
>
> Student 3: Finished!
>
> Student 4: Yep! Got it done! After all the students finish the reading and raise their hands signaling completion, she makes notes on her clipboard.
>
> Armstrong: I am going to figure out the average reading time for this class and then I'll figure out how many pages to assign third block based on the class reading time. Remember, all the blocks may not have the same homework and that's okay. (Observation, Y3, #6, p. 3)

Mrs. Armstrong heard the message that pre-assessment data should drive instruction, and she implemented what she thought that idea meant. She pre-assessed the class to find out how fast the students reported that they read that particular text, ignoring issues of comprehension, vocabulary, and the potential for students' false reporting, but used this information to justify teaching to the middle of the class. In a more differentiated classroom, the teacher might use varying texts reflecting different reading levels that still contain the same general concepts or historical time periods, or might use reading support structures such as reading buddies, guided reading sessions, and books on tape. Additionally, a teacher more accurately attempting differentiation would look beyond just the pace of reading to include students' comprehension of the material and the subtleties of the author's style. Mrs. Armstrong's misunderstandings about the philosophy of differentiation, coupled with her limited understanding of appropriate instruction, yielded a disaster that she believed to be effective, data-driven instruction, differentiated by reading ability.

Despite varying degrees of actual proficiency, Accessorizers' practices did reflect efforts to include new ideas into their teaching. They attended conferences, gathered ideas from other teachers, and continually looked for new ways of delivering their content. The new practices attempted in the classroom were often more showy than substantive, but nevertheless, these teachers spoke confidently about their teaching, and clearly felt that they were effective, expert-level teachers. Some teachers in this category even presented at conferences and provided professional development to others in their districts and beyond.

These teachers were frequently held up as models of differentiation by school administrators and some coaches. Accessorizers generally identified themselves as more proficient in teaching than they seemed to demonstrate in observations, and others

(particularly supervisors and parents) frequently affirmed these beliefs. Many of these Accessorizing teachers believed they already knew and used the ideas. Others were the first to jump on board when the study began, meeting with coaches and immediately using the first ideas presented to them. Jennifer Snowe, a seventh grade science teacher in the second year of the study reflects on how she already felt like she always differentiated her science instruction, but prior to the study, she lacked the vocabulary to name it.

> I feel like . . . I had already done this. I really do feel that way. It was something we covered a little bit. I'm only a third year teacher. I just got out of college. We did cover some of this where we went to school. But I feel like my perception of how I wrote up lesson plans and how I did them changed. I started to do it a little bit more often or I started to try and reach different learning styles and different levels of intellect differently. You know what I mean? I made it more—I knew the vocabulary. I knew the lingo. I knew how to formalize my lesson plans a little bit better. If I was doing a tiered activity, well, then I called it that. Before I had not [called it] that. (Teacher Interview, Y2, #1, p. 2)

Most of these Accessorizing teachers, including Ms. Snowe, did not progress very far over time with differentiation and performance assessment, but rather took parts of strategies that seemed to fit best with their vision of teaching and learning, ignoring the more substantial components of the philosophy. This "cut and paste" approach to implementation was often showy, but incomplete and often misguided. It is not that their enthusiasm for the study waned in many cases; instead, they believed the other components were not appropriate for their classroom. Beyond the initial, superficial applications of differentiation and performance assessment, full implementation required more commitment of time and resources or a reconfiguring of existing beliefs and practices. They viewed differentiation and performance assessment as another strategy to use occasionally in the classroom to liven things up or, as one teacher put it, "another tool in my teacher's bag of tricks," and with the occasional use of these "tricks," believed that they were truly differentiating. For these teachers, they often missed the principle that differentiation and performance assessments build on effective teaching. Patsy Milmont, sixth grade language arts teacher, believing she addressed all students' needs with tiered assignments, explained how she differentiated products by using two novels with multiple choices of culminating products.

> [For the group reading *Zia*] I asked them to write an essay for a culminating activity. I did give them a single topic. I told them I wanted to discuss the author's use of development of character, plot, and theme, in *Zia*. For the *Island of the Blue Dolphin* group, the final exam was that I gave them a variety of questions from which to choose to write an essay. We had an alternative ending was one, an essay explaining how the novel was an example of a novel of survival and they would need to support their answer with specific examples from the book, and they had to give at least three examples, well supported. Another option was to write a character sketch of Carona describing her personality as she

> grows from girlhood to young womanhood and I asked them to use at least six descriptive adjectives. (Teacher Interview, Y3, #5, p. 9)

Ms. Milmont believed that she was effectively differentiating products by using multiple novels loosely tied to the concept of survival, in addition to allowing student choice in assessment activities. Her lack of instructional focus became evident as she explained the culminating activities that focused on varied components of her unit, but did not encompass all of her unit objectives. The tiered assessments presented above reveal gaps in the teacher's clarity of purpose, degree of understanding of effective instruction, and the misuse of differentiated assessment tasks. More effective differentiated assessment would address all the objectives identified by the teacher at the beginning of the unit, with the assessment tasks tiered on multiple levels of complexity, abstraction, detail, reading level, or some other specific criteria driven by the needs of the students.

The strength of Accessorizer teachers' identities as practitioners seemed so formidable that they seemed to feel no need to reconstruct; instead, they viewed differentiation as an "accessory" to their teaching, a plant in the corner that adds brightness and color to the room. The experience with the study did not prompt these teachers to do any deep reconsideration of their beliefs about teaching; they were well satisfied with what they were doing and felt no need to make renovations to a house they viewed as structurally sound.

Teachers as Redecorators

Redecorators were targeted implementers, focusing efforts in specific areas of the curriculum, using specific strategies and components that aligned with deeply held beliefs about teaching and learning, and implementing these on their own schedule. The factors that seemed to motivate teachers to change their practices were diverse: they appeared to feel some responsibility to their students, and to best address their instructional needs, but also seemed to be motivated by their own personal agendas. These teachers generally possessed a strong command of their discipline, and were effective classroom managers. Their knowledge of pedagogy was generally less commanding than their strong content knowledge; many of the teachers were former high-school teachers or transferred into education from other discipline-related professions. Many of these Redecorating teachers were seasoned—several possessing greater than 20 years experience. The teachers' classrooms were, in general, less showy than their Accessorizer colleagues, and unlike Accessorizer teachers, they generally did not stage glitzy lessons for the benefit of observers, perhaps because they believed that they knew better than the innovators and coaches about what fit their needs and saw no need to impress coaches with trying something they knew would not work for them. When they did attempt new practices, these teachers accurately interpreted and implemented selective components of the innovations, and built on effective—although predominantly traditional—teaching practices. In general, these teachers' deeply held beliefs about the nature of schools and their role in them were dogmatic, rigid, and inflexible. Examination of their own beliefs and practices did not usually occur in a deep and systematic manner; teachers were

willing to assimilate new learning into their existing belief structure, ignoring and discarding the components that conflicted with personal philosophies. Jeff Allen, a math teacher at Greene Middle School revealed his bias toward direct instruction, and his preference towards teacher-directed instruction.

> What it boils down to is the kids are supposed to learn from their reading. Which is fine in theory. But again, I am a strong believer, in . . . I teach, I give the examples, and generally by and large they still have a lot of reading and math to do from their book. Usually that is going back and reading into another facet of what I've already taught. In other words, I'm asking them to make a connection rather than teach yourself. . . . Direct instruction. I believe the children have to be taught skills before they can use them. That is coming back . . . I guess I'm coming back into vogue. It used to be, at my old school for instance, we were told, now we don't want people up there teaching because we told the parents of this school that we are on a new course, children learn by getting together in groups by discussing things. This is one of the biggest decisions of my life . . . no, I'm not going to do that. Last period, I had parents come to me and say, "my God, you are the first person we saw teach today." [And I replied] "Yes, but I could get fired." (Allen Interview, Y3, #4, pp. 4-5)

Mr. Allen's strong belief that teaching equates with direct instruction was unbending and non-negotiable. He viewed teaching as something he tightly controls, rather than a negotiated conversation between the teacher and the students. His beliefs were so firmly embedded that he ignored the components of differentiation philosophy that conflicted with his beliefs about direct teaching and learning. But instead of ignoring the innovation altogether, he was able to assimilate selective components into his existing structure. Within his traditional framework, and in alignment with his instructional practices, he was able to informally pre-assess his students' readiness levels and group them for assignments tiered on levels of difficulty.

> I looked at some quiz results, because it was earlier in the year, I looked at some quiz results, or their last class work or lab activity and made groupings according to which level, you know, I thought they could achieve at. Um . . . and I think there was one group that was weak and that I probably could have made a couple of switches of stronger children, um . . . or should I say somebody who had a little more leadership. (Teacher Interview, Y2, #4, pp. 6-7)

Further, he planned tiered assignments based on students' interests, being conscious to include role models for female and minority students (but also perhaps stereotyping to assume everyone would select a person of their color or gender).

> . . . needless to say children who were minorities chose minority oceanographers. That's kind of the way it went even though that's not 100% the way it went. Of course the girls were thrilled that there were—after we study oceanographers of the past which were all male. The girls were thrilled to find out that there were actually female oceanographers living and who would e-mail them if they e-

> mailed them . . . so that sort of interest differentiation has gone pretty well . . . I think the girls, like I said, were thrilled and there was actually a black female oceanographer and of course they were just beside themselves. (Allen Interview, Y2, #7, pp. 3-4)

Observers initially described Joan Borden, seventh grade science teacher at Langley Middle School as a resister because she appeared hostile in professional development sessions and uninviting in her classroom. "Joan Borden did not participate at all during the second year and it was my sense that she wasn't going to this year" (Observer Field Notes, Y3, #3, p. 2). For this reason, it was difficult to comprehend Borden's extensive training and involvement in workshops—both as a part of the current study and others. Coaches initially "wrote her off" as a resister despite the fact that her resistant exterior masked her internal reexamination of her practices and the fact that she considered including some elements in her classroom. However, in the third year of the study, Borden implemented components of a differentiated assessment, Creature Classifications that was designed for her specifically by her study coach. In this assessment, students created a guide to insects and bugs indigenous to that area. The task was differentiated on two levels based on students' knowledge and understanding of life sciences. The first level task was targeted at students functioning at grade level regarding the knowledge and understanding of life sciences. Students were charged with producing a consumer guide (for homeowners) to common household pests. The second level task was targeted at students functioning above grade level relative to the knowledge and understanding of life sciences. In this task, students were challenged to produce a professional guide (for exterminators) to household pests that suggests classifications, proposes varied alternatives to control them, and provides consequences for the proposed methods of control. While both tasks gave students a chance to demonstrate mastery of the state's standards in life science, the second task required additional levels of problem-solving, included multiple steps to the problem, and challenged students to consider the consequences of extermination methods on the environment, the life-cycle of other pests, and the consumer's home.

> She took that task and she implemented it. I would say that she implemented the task with fidelity. That would be the other thing that I think would be a big plus. I viewed it as a significant achievement with Joan Borden when she took [the task] on. Boy, you had to haul her to the water trough kicking and screaming, but when she got there and decided on her own to drink, she took that to task and she went to town with it. She was serious about it. She got good work out of some of those kids. (Observer Exit Interview, Y3, #2, pp. 43-44)

Redecorating teachers were largely effective instructors, but tended towards the traditional beliefs and philosophies of teaching: most had teacher-directed styles, and maintained control of most classroom elements. Because of the teachers' skill with control, management of student behavior was not an issue. The students acknowledged that the teacher was the decision-maker, and students were trained to follow directions. Redecorating teachers seemed to have other characteristics in common, such as fast-paced instruction, a business-like demeanor, an aura of professionalism in teaching, and a

solid grasp on the content they taught. They recognized the diversity of students and the need to differentiate. A coach reflected in her journal about Jeff Allen's realization about differentiation.

> He [Mr. Allen] recognizes the need for differentiation for those who either already know the material or catch on very quickly. He has been most concerned however with establishing a classroom atmosphere in which students were in control and responsive to him before adding any elements. (Greene Coach Notes, Y3, #7, p. 6)

Redecorating teachers continued to seek opportunities to grow and change—within the confines of their traditional frameworks. Selective new ideas were assimilated into existing frameworks, while ideas incompatible with their beliefs were discarded. Two Redecorating teachers reflected on their need to continue to push themselves forward. Joan Borden, a seventh grade science teacher explained how she wanted to continue to expand her horizons to include more performance tasks, while firmly clutching her convictions about the textbooks, state-testing preparation, and direct instruction.

> In fact, I'm looking forward to an activity next year and I'm thinking maybe this summer about trying to make it a unit . . . that's a maybe . . . and see if I can go back and incorporate the textbook and all of this stuff that we're held to the fire with, and let everything that I do revolve around entomology, but that's just a pie in the sky idea right now, and it would just depend on . . . if I really had . . . I just have to sit down and look at what I could incorporate using the insect . . . I think it's a possibility, but I just have to go through . . . (Borden Interview, Y3, #5, p. 4)

Jeff Allen, a math and science teacher analyzed his own practices, but did not question his underlying assumptions about teaching and learning.

> I'm never comfortable. That's the good and bad of teaching. You are never really comfortable. It's like . . . I'm wondering in science why do I do more of the independent choice type of things where it requires the kids . . . like I differentiate the requirements, like with organizers and then I don't do that in math and why don't I give more tiered assignments in science, it's constantly running through my mind. Don't the two fit, doesn't one fit here. . . . So I never really get comfortable with it all. (Teacher Interview, Y3, #4, p. 8)

Redecorating teachers believed they accurately implemented the innovations presented—and to a large degree they were correct. They selectively chose parts of the philosophy that aligned with their deeply held beliefs and assumptions—and accurately implemented those parts—but categorically dismissed the other parts that do not fit. While human learning includes assimilation, the danger exists when the teachers only select and implement part of a larger initiative, and believe they are fully addressing all components. The teachers believe they are changing practices, but the reality is merely new wallpaper, rearranged furniture, or perhaps refinished floors. The process of

redecoration can be messy, can require extended effort, and can change the way the house looks. Yet, despite the disruption and surface appearance change, the wallpaper may cover the cracks in the walls, the curtains only hide the cracks in the glass; the underlying structure remains the same.

Teachers as Renovators

Renovators' primary responsibility was to the students, and after evaluating their practices and beliefs, they felt that the innovations presented would improve the services. Renovators ranged in years of teaching experience from novice—less than 3 years—to veteran—greater than 20 years. Regardless of experience, these teachers had in common a teacher identity that included receptivity to learning new ideas—even alternatives that seemed foreign and unfamiliar and a teacher belief structure that prioritized the needs of children over their own personal needs—but more notably included a willingness to take a risk to examine their beliefs, shift their practices, and accept a higher tolerance for ambiguity. These teachers seemed to realize that ambiguity is a natural consequence of the process of learning; they recognized that discomfort is necessary for growth. These teachers were open to comprehensive renovation of their instructional practices, to the chaos associated with the assessment of their teaching structure, and to accept vulnerability as they rebuilt and reassembled the walls, doors, and windows of their teaching.

Many of these teachers' prior beliefs were compatible with the philosophies of differentiation and performance assessment. When they experienced professional development about these approaches, they saw, and later embraced, a path compatible with their beliefs and perceptions that addressed a nagging concern about their students.

> I always felt that—I know I'm really missing something. I know I'm just not hitting for this child. I always felt—I just always felt—successful—but like I never really reached it all and this is—I don't feel like I have really reached it all but I feel like this is helping me make certain that the child that was so bright I thought was losing and the child that was so handicapped that never got there—it's making me think a lot more and it's certainly given me great ideas on how to incorporate things for both types of students. It's something that I know I'm going to be working on over the years and I feel like I've started. I feel a lot better about that aspect of my teaching because of it. (Teacher Interview/Talbot, Y1, #4, p. 12)

Betsy Talbot, a seventh grade history teacher who was admired by other teachers at her school for her ability to create interesting and effective differentiated lessons and who seemed to be quite comfortable and familiar with the principles of differentiated instruction, expressed feeling a lack of confidence in her teaching, realizing what she still had to learn regarding differentiation.

> I don't have the confidence this year that I've had in the past. I think we all have years like that—I don't, I just—I feel like I'm trying to capture far too many things

> and—so then you question, you know you question yourself—I want to be a differentiated teacher—I want to do all this stuff—but I've also got to get this done and all these other kinds of things . . . I know I can reach that particular goal. I know it's not going to happen—It's going to happen slowly—I know this is going to be a hard year for it to happen, and I just have to accept those things. But that is a goal and to try to do more, and more and more of that, cause I really do like it. (Teacher Interview/Talbot, Y2, #1, p. 13)

Sally Morgan, an eighth grade science teacher also explained that differentiation has forced her to move forward as a teacher and reexamine assumptions she previously held.

> For years I was getting at a comfort level where I could practically do things with my eyes closed. I had been there too long. My comfort level is never to be stagnant. I want to kind of reach out. So there are days when I come home thinking if I was to rate this on a scale of 1 to 10—10 being the best, I probably could give myself a 2 because I didn't feel good about it. (Teacher Interview/Morgan, Y2, #5, p. 15)

Ms. Talbot and Ms. Morgan, two teachers with some qualities of Renovating teachers, revealed their vulnerabilities and changes in their teacher identities as they learned more about differentiation and strategies to better address student diversity in their classrooms. Previously, these teachers expressed confidence about their teaching, but when faced with a new philosophy, examined their own beliefs and shifted their practices to better align with their newly acquired views about teaching and learning.

Shifts in philosophy are accompanied by the learning of new skills and practices, which take time to develop, often falling short of expectations. Renovating teachers accepted this challenge with grace and determination, not afraid to risk stumbling or falling, explaining, "I guess I fall on my face a lot" (Teacher Interview/Morgan, Y3, #8, p. 2). These teachers recognized that learning required time and they valued the support of administrators that acknowledged their risk-taking as a part of a journey towards mastery.

> I don't feel—if one of the principals had been in here—and I felt that lesson was very lacking . . . like the one you saw—I wouldn't have felt—I wouldn't have felt bad, I could just go and say, you know, it didn't work and I'm going to look for ways to make it better. I mean it wasn't that it was a total flop today, but you know . . . it can be better. (Teacher Interview/Talbot, Y2, #1, p. 15)

Like the challenges they provided for themselves, Renovating teachers recognized that challenge for students is critical to ensure motivation in their work and pride in their accomplishments. Success, to Renovating teachers, was achieved after a degree of attainable struggle. Students, like the teachers themselves, learned that challenge requires a degree of hard work, and the teachers modeled this belief in the hard work they exerted in their classrooms.

Renovating teachers' primary focus was the reconstruction of their beliefs and general philosophy about teaching. The secondary focus was the accuracy with instructional strategies that support their new philosophy. As a result, there was great adaptation to suggested strategies that met their context and attempted to address their students' needs (objective accuracy).

In the end, very few, if any of teachers were classified as Renovating teachers; some teachers exhibited some qualities of renovating teachers in some regards, but not others. The limited time to work with teachers restricted extended coaching support, which may have contributed to a greater increase of belief shifting than occurred in this time span.

Teachers' Responses to High-stakes Testing Environments

Midway through the course of the study, one of the states included in the study transitioned to a high-stakes testing program, another state had a firmly-enculturated high-stakes testing program already well in place. Investigating how various teachers in these states reacted to the pressure to teach to high-stakes tests while simultaneously addressing student diversity allows us some insight into supporting teachers as they attempt to make sense of seemingly conflicting change initiatives.

Teachers' Responses to the Standards: Pressure and Panic

The nature of teaching standards aligned to state tests requires teachers to teach large volumes of often disjointed facts on which students will be tested and for which teachers will be held accountable. Covering the content to be tested on the state tests became the top priority for most study teachers. One teacher participating in the study described the standards to an observer "like these things that God has presented to us from the sky . . . you always have to keep them in mind as you go through the year" (Rockford Coach Journal, Y2, #1, p. 2). Pressure to cover all of the standards left many teachers feeling as though they had little or no class time remaining for either exploring important concepts not included in the standards or investigating in any depth the topics that were included. Generally, study teachers shied away from planning any activities, lessons, or units requiring more than minimal amounts of time for fear that they would not get through all of the standards they were required to teach during the school year. One teacher told a researcher,

> Now it has gotten to the point, when we did those theme projects and presentations, it took a lot of time, and we're scared to death we're not going to cover the standards. It was a lot of fun. It was! Kids loved it. I thought what they did on their own and in small groups is probably going to stick with them forever. But they didn't cover as much material as we're supposed to. So I guess we're gonna have to stop doing them, because if we don't cover it, we get in trouble. (Rockford Coach Journal, Y2, #1, p. 4)

In general, teachers felt that they could not simultaneously differentiate instruction and assessment while teaching the standards and preparing students for high-stakes tests. Two common teacher misconceptions—that differentiation *always* entails small group work and that differentiation is philosophically incompatible with the standards—contributed to this belief. Many teachers felt that in order to teach all of the standards, whole-class instruction was necessary. Teachers perceived the small group and individual work that they believed defined differentiated instruction and differentiated assessment to be too time-consuming to allow for adequate coverage of material that might be tested on the state tests. Additionally, teachers saw attending to student diversity as antithetical to teaching the standards, and could not resolve this discrepancy. Teachers did not understand differentiated instruction as a *method* of presenting the standards to the students, but rather as a separate approach to teaching. "To be honest, I am not differentiating right now. I just can't. I have GOT to cover these standards and seventh grade history is just so overwhelming. There is no time to differentiate" (Talbot Interview, Y3, #2, p. 3).

Teacher and administrator interviews were crowded with references to the panic resulting from state tests. A principal described the feeling of transitioning to a high-stakes testing environment as "getting the wind knocked out of you . . . we were all knocked off our feet by the standards" (Howard Observer Field Notes, Y3, #15, pp. 1-2). Several teachers said that the standards were "overwhelming." A social studies teacher said that the huge amount of material she needed to cover made her feel as though she was "drowning" (Howard Observer Journal, Y3, #10, p. 1). Another teacher said she felt as though the standards devalued the teaching profession.

> Abigail said that her heart was continuously beating fast and she felt she could scream. She was on the edge and waiting for the final push. She bemoaned that yesterday she was depressed after leaving the faculty meeting [about the standards]. Abigail said it made her feel as if her profession was of no value. (Howard Observer Journal, Y3, #7, p. 2)

After a particularly disheartening staff development meeting on the standards, a participating teacher vented her anger at where she felt her profession was heading.

> They can kiss my a**!. I'll be working at Hallmark. This is insane. If I had any idea what teaching would be like, I never would have chosen this job. I will tell anyone who is thinking of becoming a teacher not to consider it. This is bullxxxx. (Rockford Coach Journal, Y2, #1, p. 23)

This teacher's colorful reaction to the philosophy of teaching implicit in the standards may have been the most potent, but certainly was not unique in the pure force of its frustration, anger, and sorrow at what teachers were being asked to do. For many teachers, the way they believed they were forced to teach to the standards and assess students only on isolated facts through multiple choice tests flew in the face of everything they believed about the purpose of teaching. One teacher noted,

> It just seems a little backward to me . . . I really think there is going to be a shift in paradigms where we are going to go back to traditional learning where we have these folders. You will pretest, test, and determine if they've mastered the standards. Which seems mostly factual based to me. It's really a discouraging atmosphere hanging over us right now. The principal himself said that it's the biggest thing he's seen . . . . He even said to me, "It is kind of frightening." (Howard Coach's Field Notes, Y2 Summary, p. 4)

Furthermore, many teachers felt that their jobs were being altered so significantly by being given a list of required standards to teach that they were no longer allowed any creativity or freedom in their curricular decisions.

> Once again, today's meeting didn't go as I anticipated. From about the moment I sat down, Betsy opened saying she wasn't for sure what I had planned, but the [coaching] group needed to discuss some things and immediately referred to the school's recent biannual plan meeting with the superintendent and the standards. She said that the school had had a rough week and the teachers really needed our help in how to deal with the standards. Betsy went on to say that she no longer has the time to keep a journal for the project. The demands and stress being placed on them as teachers eliminated reflecting and writing time. She added that her units would have to stop being constructed around a theme. From now on, the standards would be the "backbone of her lessons." Betsy apologetically said, "I have no choice" and went on to explain that checking and measuring mastery of standards would have to be her first priority . . . . She said that she was not giving up on differentiation, but it couldn't be done the way it should be done. She ended her opening comments saying, "I can't do any more. I'll do the best I can. They can fire me." (Howard Observer Journal, Y3, #10, p. 1)

For many teachers, being forced to teach to the standards was professionally and personally devastating.

> Sometimes, I will scratch my head and I don't even know where to start. I just worry about myself and my cat and just finding time to go to the grocery store. I wonder, what I am doing with my time? Am I not managing my time right? Why am I tired all the time? I feel like I am just going to explode. (Houghton Interview, Y3, #1, p. 3)

The pressured and panicked environment even caused several of the participating teachers, including the individual quoted above, to leave the state, school, and/or teaching profession.

Teacher Responses to the Standards: Playing the Game

For other teachers, the introduction of the state testing program evoked more moderate reactions. To this group of teachers, the standards simply represented another change initiative in a long line of change initiatives. One seventh grade language arts

teacher noted, like many teachers, that the new testing environment allowed her little time to work on anything other than the specific facts and skills that would be tested, but she did not struggle deeply with the philosophy underlying high stakes testing as some of her other colleagues did. Rather, she accepted the change as "part of the job."

> I think what testing does with me is it just emphasizes the fact that you have to stay on track. It's becoming more and more important that you do, because as you look at the standards and the layers that go with it, you can't let too many days slide that you are not teaching areas in the curriculum specifically geared toward skill development, reading development, writing development. And although testing is important because it's a diagnostic tool and you need it, it still hurts. The time that I have to donate to it, I'd much rather be doing paragraph correction, reading aloud, or investigating their emotions and ideas as linked to the characters in stories. It's just hard to devote the amount of time you have to in preparation for one of those tests . . . but that's just part of the job. (O'Leary Interview, Y3, #1, pp. 2-3)

Another teacher seemed comfortably resigned to tackling the new initiative. While able to recognize the weaknesses of high-stakes testing, he accepted that they were a reality and plugged on.

> I think one thing we are going to emphasize more now is we are going to purchase a scantron machine and try—especially with the eighth graders—to improve their test-taking skills because as much as all of us don't like multiple choice, we've got to be realistic that's what's happening to them. We've got to make them better test takers. (Shane Interview, Y3, #1, p. 3)

Interestingly, what these teachers possessed that other teachers did not was the ability to accept what to them seemed inevitable, no matter how stringently it clashed with their beliefs about teaching. Both of these teachers had been teaching for many years, and while neither of them expressed support of the standards initiative, they seemed less threatened by it than did their less experienced colleagues. It seemed that, for many experienced teachers, survival within the school system overran all other considerations. One experienced teacher commented,

> The state testing program represents our curriculum and I think it's just a new way of looking at the way things are done and the way we are being expected to teach. We are being held accountable for those standards, so I think they are going to have to be our primary concern. There are things that are not good about it, but I can understand why that's the way it is. (Allen Interview, Y3, #1, p. 12)

In each of these instances, the teachers articulated that their experience allowed them to see the standards movement as "just another change."

> I think historically I've been faced with a lot of changes. I went from a junior high to a middle school and from a middle school to a magnet school. I went

> from a magnet program that went through four principals in five years. I changed into this building when it was brand new and never been opened and we were two weeks late starting because we weren't ready. Every other school in the city was operating and we were still sitting here with empty rooms. So I've been through a lot of changes and I guess maybe you just get accustomed to it. When you've been around for a while, I'm sure you get a different perspective of what's going on. I agree there are some people who are not going to change no matter what. I don't know what to say. The powers-that-be will eventually catch up to them if they don't. (Shane Interview, Y3, #1, p. 7)

Another long-time teacher echoed the sentiment that change is an inherent part of teaching. Rather than resisting an initiative with which he didn't agree, he indicated that he would simply bide his time until standards and high-stakes testing, as was his experience with all other past initiatives, disappeared.

> A lot of teachers have expressed their concerns about the standards movement, and like I told the younger teachers, don't get bent out of shape, cause seven years from now, they'll scrap it. I'm telling you, 20 years experience, they run their course after seven years, they say it was a mistake and they come up with something else. The Reading test is a prime example, the competency tests in high school, all dead. Whole language, dead. (Smith Interview, Y3, #13, p. 8)

In one case, longevity allowed a teacher to be bold in his misgivings about the standards movement. Three years away from retirement, this teacher felt that he had the freedom to express his concerns in a note to the superintendent. He was particularly concerned that high-stakes testing was inappropriate for the largely struggling population in his school. "We are telling kids they need to come to school and we give them all this schooling, and then we just show them in a lot of different ways how they fail" (Rockford Observer Journal, Y2, #1, p. 26). He stated that he had gotten into trouble with the principal for talking about the standards in this manner, but indicated that he was not concerned. However, the list of standards was on his desk and the objectives were written on his board daily. "I can play the game like anyone," he commented (Miller Interview, Y3, #14, p. 2).

For these experienced teachers, "playing the game" seemed to be the key to their survival in the teaching profession, as well as to their survival of this newest initiative. Their years of teaching experience afforded them the confidence in their abilities necessary to weather the storm and to integrate the philosophy behind the standards initiative with their existing beliefs. All four teachers were able to articulate ways in which they could combine the principles behind differentiated assessments and differentiated instruction with the content and test-taking skills they were required to teach.

> I'm looking at the standards in terms of concepts and I'm looking at—when I write my lesson plans now it's like my lesson plans are not written chapter 1, chapter 2, chapter 3. My lesson plans are written scientific method, my lesson plans are

> written metric system, my lesson plans are written by the concept. That's what I'm doing this year and I'm looking at what we can do to change our current curriculum so that when these standards tests hit us that we are—that we have basically done the things that we need to do before the tests, not after. (Shane Interview, Y3, #1, p. 5)

Another teacher explained how she envisioned tying together performance assessments with the standards:

> My sixth graders are doing my favorite book, *A Day No Pigs Would Die*, and one of the standards is summarization, so I thought, you know, that's fine, I'm having them do a diary and each day, they do their summary as a diary entry, and then they hit the technology standard, and they put that diary on a page, a Claris Works page, and then use it and present it as a slide show. (McKnight Interview, Y3, #5, p. 7)

While these teachers could *articulate* how they were attending to both student diversity and the standards, researchers never actually saw evidence in their classrooms of the integration of differentiated instruction and differentiated assessment with teaching to the standards. This discrepancy indicates that experience may have also taught long-time teachers how to "play the game" of two change initiatives simultaneously.

Conclusion: What High-stakes Testing Taught Us

Regardless of whether teachers perceived the new high-stakes testing environment as personally threatening or as simply another passing "fad," classroom observations and teacher interviews indicate that teaching to the tests brought differentiated instruction and differentiated assessment to a screeching halt in the majority of classrooms. Teachers who were beginning to develop a belief in and proficiency with differentiated instruction and differentiated assessment felt forced to abandon their new practices and revert to prior paradigms of teaching. In most cases, this meant returning to traditional whole-class instruction with few, if any, provisions made for student diversity. "It's like, everything I've done—the differentiation, I've been excited about it and now somehow I have to push that aside and start all over again" (Talbot Interview, Y3, #8, p. 10).

Clearly, if there is to be any hope for the regular and sustained use of differentiated instruction and differentiated assessment in the classroom, teacher in-service training must address teachers' concerns about high-stakes testing. Training teachers to use differentiated instruction and differentiated assessment must include practical methods of addressing the standards while attending to student diversity. Classroom coaching, modeling, or co-teaching to ensure transfer also needs to be included. Teacher training may also need to take into consideration the teaching experience of individual teachers. Newer teachers need different types of support during the change process, including encouragement to reflect upon their developing systems of beliefs about what teaching entails and how to remain true to these beliefs while

simultaneously surviving top-down initiatives that may conflict with those beliefs. Supporting more experienced teachers through the change process may require more focus on integrating new philosophies about teaching with those that are already deeply entrenched.

Coaching Teachers for Change

It has been said that teaching teachers is not unlike herding cats: unique creatures moving in different directions, with various destinations in mind, exhibiting differing, creative movements. When forced to proceed in a direction different than the one they envisioned, teachers, like cats, can clearly show their displeasure. Teachers possess individual needs, biases, beliefs, and interests, all of which influence how they hear messages about addressing academic diversity during professional development sessions. The lives of teachers—the myriad of classroom details, student and parent issues, not to mention their own personal lives—further affect their ability to accept the invitation to change. Subsequently, these and other factors determine whether teachers translate the message into changed instructional and assessment practices in their classrooms.

In each treatment site, coaches found differing challenges and resources to address the challenges. In differentiation treatment sites, coaches worked with teachers to identify areas of their teaching that would be most aligned with differentiated units, lessons, activities, and tasks, selecting areas of curriculum where wide ranges of student readiness, interests, and learning profiles could be incorporated most effectively. Coaches and teachers worked to ensure focus and clarity of learning objectives, identified appropriate pre-assessment strategies or tools, determined objectives for specific units and lessons, and determined the most appropriate instructional strategy to use to best meet the wide range of learners' needs. Coaches and teachers discussed classroom management strategies and worked to ensure success of the attempts at differentiation. Some teachers were more open to coaching than others; some brought specific issues and requests to meetings, such as wanting to reconcile test preparation and differentiation or an interest in learning more about compacting. While specifics varied across settings, some factors remained constant across differentiation sites: coaches assisted with resources, information, and support for the purpose of increased use of differentiated instruction to meet diverse students' needs. In some sites, the teachers themselves created and used the differentiated materials; in other sites, coaches prepared instructional materials based on teachers' identified needs and/or coaches' observations and interviews with teachers. But in most sites, teachers and coaches worked collaboratively, such as in the example of coaching at Howard Middle School.

> I helped Sally map out her unit on sound and light to be part of a bigger umbrella . . . . We discussed that the best approach was to think about commonalities between sound and light, rather than studying them separately, consider it as the "Study of Movement and Matter." (Howard Coaching Notes, Y2, #9, p. 3)

In performance assessment sites, coaches worked with teachers to ensure clarity and focus of objectives and to identify areas in their curriculum that might be well suited for a performance assessment task. Coaches probed teachers' thinking about the units and brainstormed possible authentic tasks for demonstration of student mastery of objectives. Hypothesizing that teachers would increase use of performance assessments if the materials were created for them, most coaches wrote the assessment tasks and graduated rubrics—embedding the state standards and guidelines into each task—and presented the finished materials to the teachers for feedback and classroom use. Through the process, some coaches worked with individual teachers to develop their own performance assessments. A coach reflects on a coaching experience with a capable, but reticent teacher at Langley Middle School.

> Janice said that she would be doing the colonization of [state] during November. She and I brainstormed task ideas. She said that in the past, she had students imagine they had settled in one of the new [state] colonies. Then she would ask students to write a letter home to their family in Mexico and tell them all about the colony in an attempt to persuade them to join her in the new [state]. I told her I thought that would make a great performance task. We discussed some of the details she wanted included in the task. She asked that students be required to describe the geographic location of their colony, refer to the colony by name, and discuss what was happening in [state] at that time. I told her I would create a prompt and rubric for her by early November so she would have a chance to make modifications if necessary. (Langley Coach Notes, Y3, #2, pp. 5-6)

Assisting teachers to prepare differentiated instructional or assessment materials versus preparing materials to teachers' specifications varied by treatment group; other variations in coaching approaches varied by individual style, philosophy, and beliefs about teaching and learning. Coaches approached the challenge of delivering new information to teachers in various ways and with differing goals in mind. Some coaches sought a high degree of teacher involvement; others were less concerned with numbers of participants, but instead sought a high degree of technical accuracy with the teachers that participated. Some coaches valued the personal relationships and positive interactions with the teachers, while others valued teachers' positive reactions to the message the coach delivered.

Roles Coaches Play: Relationships Between Coaches and Teachers

Coaches assumed multiple roles throughout their tenures at the sites. Coaches modified the roles they assumed in response to school climate, teacher receptivity, and individual relationships between the coach and the teachers. Each coach was charged with the challenge of instigating and facilitating change in school, a task that was difficult, if not significantly distasteful to teachers. Coaches were selected for the project based on their knowledge of differentiated instruction and/or differentiated assessment, and most had experience working in public schools, specifically middle schools. While the coaches knew the specific approach to academic diversity at the school's treatment site, they were not specifically trained as change agents. Coaches were dependent on

their own proclivities and instincts about how to undergo this formidable challenge: engaging teachers' cooperation, interest, and commitment to the project. Consequently, the coaches approached the challenge of affecting change by assuming a variety of roles, sometimes changing over time in response to changing school climate, individual teachers' responses, and over the life of the study. For many, this role revolved around interpersonal relationships; many coaches believed it was important to be liked and valued by the teachers in order to enact change. Another role assumed by some was that of the savior or rescuer. Savior coaches took pride in the offerings they provided: liberating teachers from unpleasant previous circumstances, resourcefully locating needed materials and supplies, artfully negotiating more livable working conditions, or creating loopholes to substitute study-related professional development for district-level workshops or requirements. Savior coaches endeared themselves to their teachers by championing their causes, as demonstrated in this vignette about Gretchen, a fictional coach comprised from a composite of several actual study coaches.

> Gretchen repeatedly heard teachers tell her how much they needed more planning time before they could begin to try these differentiated strategies in their classrooms. When Gretchen arrived at the school, she made a beeline for the principal's office. She explained to the principal how teachers constantly bemoaned the need for additional time to develop and implement differentiated lessons like they were hearing about. She persuasively argued the case for additional planning time during school hours for the teachers participating in the study. Before the end of her visit, she made a point to share with her teachers how she secured them this valuable resource. Teachers believed that Gretchen was their ally, and the increased planning time served as a positive offering to the teachers in exchange for increased study buy-in.

A role assumed by other coaches was that of cheerleader. Cheerleader coaches generated enthusiasm for the project as a whole: participation—at whatever level—was encouraged, affirmed, and celebrated. Cheerleader coaches spent great amounts of time writing personal notes and cards to the teachers they worked with. Each note was personalized to encourage the gradual risks they undertook in their classrooms. Additionally, cheerleader coaches supplied cheerful tokens and incentives to further bolster teachers' positive attitudes about their efforts and the project in general. Cheerleader coaches sought continued involvement by increasing teachers' confidence about the unknown, applauding each baby step—no matter the size—they took in the journey. This role is evident in the vignette of the fictional coach Alexa, a composite of several actual study coaches.

> Alexa, in her third year as the coach at a performance assessment site sat with the seventh grade team of teachers as they sketched out their second semester plans. The teachers debated issues and topics such as field trips, when to schedule the dance, and what collaborative project might make sense to work on. Alexa perked up her ears at the possibility that these teachers might suggest a performance task, without her instigating the idea. After discussing the project for several minutes, one teacher suggested the use of a rubric. Alexa was jubilant.

> "A rubric! They finally thought about using a rubric!" She realized it was a small step, especially given the amount of time the school worked on assessment, but she was thrilled nonetheless.

Another role played by coaches was that of best buddy. Best buddy coaches entered the lives of teachers—emotionally and socially. These coaches identified themselves as peers, equals in the process—despite the difference in roles. Best buddy coaches sought to know and assist the teachers in a holistic sense, not just limited to the scope of the project objectives. It was not uncommon for genuine friendships to develop between best buddy coaches and the teachers they worked with, complete with meeting the teacher's family members, joining the teacher's family for dinners when in town, starting the day "catching up" over a cup of coffee, or ending the day at happy hour at the local teacher hangout. Rachel, a composite of several actual study coaches developed a close friendship with Lisa, a teacher at the school.

> Rachel turned to catch Lisa, an eighth grade math teacher, as she walked out of the room after the observation. She pantomimed drinking and signaled with her head that she'd meet her for a cup of coffee after the day was over. Lisa knew just what the signal meant. The two women had a great deal in common, they realized over the year, and when the two sat down over coffee, would spend at least as much time gossiping about their same-age children, their husbands, and the upcoming dog show [they both had competing dogs] as they would about school.

This personal connection between coach and teacher is a two-edged sword. It ensured continued access to the teacher's classroom and a source of motivation to continue in the journey towards change. It was likely that the teacher would continue to participate if only as a sign of friendship and confidence in the coach. It did, however, become a more challenging task for the coach when he/she was required to give critical feedback to the teacher. Coaches found ways to couch description of the areas of needed growth into areas of strength, thereby softening the message. Sometimes, teachers felt that they were more effective than they actually were based on the type of feedback they received. Further, other teachers in the school perceived that these "buddy teachers" must have mastered differentiated instruction or performance assessment based on the personal relationship between the coach and teacher.

For other coaches, personal relationships were not critical to the process of coaching. These coaches believed the message of differentiation or performance assessment was more critical than the messenger who delivered it. While these coaches did not do anything to hinder a collegial working relationship, they saw no value in overt enthusiasm, personalized messages of inspiration, or interference in school-based issues such as planning or materials. For these messengers, their role was simply to transport the initiative from theory to practice, from the university to the teachers. The preference to emphasize the message more than the individual teacher relationships is described in the following scenario from composite coach Janet.

Janet stood before the group of teachers at the professional development session and outlined the day's agenda. First they would begin with reviewing the principles of an effective performance task, followed by content-specific examples at each grade level. The afternoon session would be spent working with several coaches to modify existing performance tasks or to hatch ideas for new ones. As Janet ticked off the objectives for the day, Nancy, a teacher in the audience remarked later how much she appreciated the logical sequence of events, treated more intellectually than emotionally.

Coach Expectations

Coaches varied in their expectations for their teachers and for themselves, their perception of the initial goal of coaching, and their approach to resistant and struggling teachers. For some coaches, the need to be liked was critical. This need for a sustained positive relationship and continued invitations into the teachers' world rivaled the need for full actualization and technical accuracy of differentiation and performance assessment. For other coaches, being liked was of little concern: these coaches worked for precision in the implementation of the approaches. These dichotomous views are represented in the views of two coaches: Alexandra and Bettina.

Coach Alexandra

Coach Alexandra was highly motivated by the personal relationships she developed with the teachers in her school. She worked incredibly hard to schedule her visits carefully so that she could observe and coach as many teachers as possible and still have time to attend team meetings and listen to the issues and concerns her teachers raised. During one of her visits she found time to attend a field trip with the eighth grade team which she believed gave her many new insights into the life of eighth grade teachers and students. She wanted teachers to believe in differentiation and so she did whatever it took to find something they could do and feel successful about. For Alexandra, all teachers could be successful with differentiation if they just tried one baby step—her specialty was working with struggling teachers, helping them see that they could do it! When she planned professional development for the teachers, she delivered it in small manageable chunks. If individual teachers needed to see the "big picture," she preferred to provide that individually instead of overwhelming the whole group with that information. Alexandra's beliefs about coaching appeared to include:

1. Teachers needed to be sold on the innovation, engaged in workshops, convinced, and persuaded to change practices.
2. To increase the likelihood that teachers would subscribe to the innovation, coaches needed to affirm them where they were and make them feel good about the journey, even if that meant affirming efforts that were somewhat misinterpreted or low-level. After all, the first attempt was better than not doing anything to address academic diversity.
3. If teachers liked the coach they would be more likely to subscribe to the initiative. Subsequently, time and effort should be spent on establishing

and nurturing personal relationships with teachers in the hopes of increasing teacher subscribers, thus appealing to the emotions of the teachers.

4. Teachers that continued to make attempts—even if their efforts were surface-level applications—were successful if they continued to try. For the sake of discussion, Effort = Success.
5. Recognizing that change is incremental, she seemed to feel good if the year ended with a little bit of progress for a great number of teachers—and consequently, their students. She seemed to believe that quality issues could be addressed next time around, after the teachers felt comfortable with the initiative.

Coach Bettina

Coach Bettina was passionate about the topic of performance assessment, and was quite knowledgeable about the theoretical underpinnings of the model. She provided professional development to the teachers at her assigned school, and while some seemed to really understand and agree with what she shared, others seemed put off by the work that was required to do it well. She delivered the whole picture of performance assessment; if individual teachers needed some smaller steps, she could help them break it down individually, but didn't want to hold the whole group back. For the teachers that were interested, she worked tirelessly to help them plan, create, or implement curriculum or assessment for their classes. For the teachers that were not interested or resisted, she simply let them go—it was not worth it to try to force herself or the initiative on those that did not have the capacity or interest to change. Bettina's beliefs about coaching seemed to include:

1. The message of the innovation was powerful and should be the determining factor in teachers' decisions to subscribe, not by cajoling and convincing or appealing to the emotions of teachers.
2. The message was more important than the messenger. Subsequently, time and effort should be spent on explaining the message, providing examples and applications—not getting the teachers to relate personally to the coach.
3. It was not as important to have large numbers of teachers subscribe to the initiative as it was to have clear examples of teachers—even if only a few—that fully understood and implemented the initiative accurately and at a high level.
4. Teachers that tried should be affirmed, but they also needed to have realistic and critical feedback about what could have been better.
5. Recognizing that change is difficult under any circumstances, it is important to be clear about what is expected—what the goal looks like. She seemed to feel good if the year ended with a great deal of progress, even if only for a small number of teachers, believing that as a result some students would have much richer instruction and assessment. She seemed to believe that using successful teachers' clear examples of accurate

> differentiated instruction or performance assessment would help to increase participation in project objectives the next time around.

The Influence of School Climate

Environmental Factors and Their Effects on Change Initiatives

Administrators in the study sites varied widely in terms of their support of the introduction of differentiated instruction and differentiated assessment into their schools. Administrators' responses to the initiatives were similar to those of teachers, ranging from highly positive verbal and behavioral support and participation to complete avoidance of interaction with researchers and the study as a whole. The level of an administrator's verbal and behavioral support of the NRC/GT project often had profound effects upon the willingness of the school as a whole to participate in implementing the initiative.

The Principal at Howard

Throughout the 3 years of the study, Eric Waters, the principal of Howard Middle School, demonstrated consistent support of differentiated instruction, both verbally and through his actions. Waters attended—and was an active, positive, and participatory presence in—staff development meetings on differentiated instruction. His conversations with researchers and teachers, as well as his behaviors, showed that he approached the initiative as an opportunity for the whole school—including himself—to learn.

> Toward the end of the meeting, Eric drew attention to a phrase he had written at the bottom of the agenda. It read, "An effective school is one in which the teachers continue to learn." He told the group that if that phrase were in the dictionary, the pictures of Howard's faculty would be presented beside it. (Howard Observer Journal, Y3, #6, p. 1)

Waters remained unfailingly positive both about the importance of differentiated instruction and about his faculty's ability to implement it. Additionally, he talked to his faculty about their efforts to differentiate instruction, visited classrooms, and provided planning time and support for teachers who were involved in the study.

> First, I noticed Eric's continual attention to building the faculty's morale. It came in many forms. Most impressive to me was how Eric continued to praise the faculty's work as he explained the challenges of the standards . . . "No kid at Howard," according to his description, "has an inferior teacher." (Howard Observer Journal, Y3, #6, p. 1)

However, while supporting his teachers, Waters also allowed teachers room to experiment, make errors, and make their own decisions about what happened in their classrooms.

Waters' basic philosophy about teaching—that risk-taking and mistake-making are integral parts of the learning process—allowed him to convey to his teachers the importance of participating in the study. Additionally, Waters routinely and publicly stood by the decisions of his staff. Accordingly, knowing that they were "protected" by Waters, teachers at Howard were comfortable taking the types of risks in the classroom that differentiated instruction entails. They were confident that even if a lesson flopped, they would have the support of their principal. As the Howard coach observed, the teachers sensed in Eric both a leader and a colleague.

> Eric had the image of "he is our leader and we are behind him, and it is collegial. He is the principal and he is the leader, but he is part of the team as well." He constantly lets them know that he appreciates them. (Howard Observer Exit Interview, Y3, #1, pp. 5-6)

As a result, Howard teachers as a group were the most willing to participate in the study of all of the faculties included in the study.

> I think he encourages them . . . when they are tired and beat and don't feel like they can do it anymore, they think, we've got to keep going because we cannot let the team down. They're thinking, "Eric would want us to do this." It's not, "If we don't, Eric will kill us." (Howard Observer Interview, Y3, #1, p. 6)

The important influence of administrators creating a "safe environment" for experimentation on teachers' willingness to make changes in their classroom practices is particularly obvious in the case of Howard. In the middle of the third year of the study, the district superintendent called the Howard faculty together to present its plan for addressing the state standards in the classroom. During the faculty's presentation, the superintendent became very angry and harshly criticized the faculty's plan. One teacher described the criticism as a "slap in the face" made worse because it came from "within the camp. It was friendly fire" (Howard Observer Journal, Y3, #10, p. 4).

Waters stood up for his faculty, a move which he knew would put his job in serious jeopardy. The superintendent struck back at the principal. Teachers who were present at the meeting "expressed their concern about the public humiliation that Mr. Waters had experienced" (Howard Observer Journal, Y3, #10, p. 3). The already shaky relationship between the superintendent and Waters was exacerbated by this meeting, and Waters left Howard at the end of that school year. After the meeting, teachers who knew Waters' resignation was imminent—and therefore that their protector might soon be removed—quickly began to talk about how they no longer felt they were able to differentiate instruction in their classrooms. It was clear to them from the meeting with the superintendent that addressing the state standards was to take precedence in their classrooms (Howard Observer Journal, Y3, #10, pp. 1-4). The pressure to meet the demands of the top-down mandate—and the knowledge that their administrative support system was in danger of being removed—almost immediately halted the efforts of even the most dedicated participants in the study to use differentiated instruction in their classrooms.

> Abigail said that she didn't have the time or energy required to do it all (regular school responsibilities, standards planning time, and differentiation of instruction). Abigail explained that the pressure was great because the superintendent had told them that if a student was passing a class with an 'A' or a 'B' and not passing the state tests, then the teachers were not doing the job correctly. In Abigail's mind, and the others in the meeting agreed with her, this ultimatum meant that the teachers couldn't differentiate the work for lower performing students because it would allow the students to pass their classes, but not the state tests. (Howard Observer Journal, Y3, #10, pp. 1-2)

Waters himself continued to talk about the importance of using differentiated instruction in the classroom until the end of the study, but felt that, because of the new pressure to address the state standards, a transition period was inevitable. Waters felt confident that eventually the panic over the standards would dissipate and his faculty would be able to juggle teaching to the standards and differentiating instruction. He did not, however, have a clear plan for doing so.

> I think right now the faculty is sorting through how the differentiation fits and it has been kind of taken off the front burner in their minds because now there's thinking about the standards. But they'll reconnect with it and they haven't given it up, but they will have to struggle with a new era of accountability and dealing with it before they probably get back to giving the time and effort that differentiation deserves. And . . . they've been perhaps a little sidetracked in their thoughts and ideas right now and then they're dealing with some other realities and I think many of them, thought have seen the value of differentiation and they'll never stop doing that. (Waters Interview, Y3, #11, p. 1)

Initially, Waters' consistent verbal and behavioral support of his faculty, coupled with his belief in good teaching as a process of on-going learning and risk-taking, provided Howard teachers with a safety net that allowed them to experiment with differentiated instruction. However, when this safety net was removed, teachers immediately began to recoil from the idea of experimentation and returned to the more familiar and comfortable front-of-the-room, whole-class style of instruction.

Greene Middle School

At the beginning of the study, Greene Middle School appeared to be an ideal setting in which to attempt the implementation of differentiated instruction. Greene was a school with a stable environment, well-behaved students, and a self-proclaimed desire to be innovative. However, the school turned out to be one of the more resistant of all of the participating schools to the study. Resistance was more subtle and polite here than in other resistant schools, but the end result was the same: few teachers made any efforts to even attempt differentiating instruction.

Greene had two principals over the course of the study. The first principal, Gina Parks, was enthusiastic about the study and successful in enlisting and encouraging the

participation of teachers. Because Parks gave great attention and status to the study, Greene teachers were initially enthusiastic about participating. At the end of the first year of the study, Parks left and was replaced by Linda Walker. The principal change brought with it a few complications. A significant number of teachers initially in the study left the school after the principal change. Additionally, according to the coach, Walker was less devoted to the study than Parks had been. While she expressed verbal support of differentiated instruction, her behavior indicated that she did not consider the study a high priority. She did little to help researchers gain access to teachers and did not encourage her teachers to participate in the study.

> I have been very frustrated in my dealings with Walker, principal of Greene. She professes great interest in and support for differentiation in her school, and has made changes to make sure that all teachers at Greene are aware of and use differentiation to some degree. At the same time, she rarely returns phone calls or provides needed information despite my efforts to be flexible and understanding of her busy schedule and to make my needs clear and minimal. Teachers have varied from enthusiastic to completely uncooperative. (Green Observer Journal, Y3, #1, p. 1)

She did not attend staff development meetings, and, while observations of teachers' classrooms were routinely conducted, the observation sheet did not ask observers to look for evidence of differentiated instruction.

Because their principal did not place high value on participation in the study and because teachers at Greene were already contending with the pressures of high-stakes observations and interdisciplinary teaching, teachers did not feel comfortable taking the risks associated with beginning to differentiate instruction. Greene teachers were unable to see beyond the pressures that confronted them every day.

> Another of my frustrations in visiting this school is that there seem to be so many circumstances that capture teachers' attentions and make this project seem least important. For example, on October 5, parent conferences were to be held in the evening. Teachers were feeling pressured to be prepared for the day and also stay until 8:00 or 9:00 in the evening. Teachers did not know I would be observing today, and no classes were using differentiated lessons. This is telling in itself. We have not made sufficient progress with any of our teachers to see differentiation as the rule rather than the exception. (Greene Observer Journal, Y3, #1, p. 3)

Many teachers at Greene responded to the invitation to change in the same manner as many participating teachers in the highly economically stressed schools (e.g., Rockford) participating in the study. Both Greene teachers and the teachers in schools in low SES neighborhoods were unable to even conceive of attending to differentiating instruction until more immediate stressors were attended to.

> Sandra was not able to attend the early morning coaching session or interview with me as we had scheduled because she had to arrange for coverage for teachers on her team who were absent. Apparently, as team leader, she must provide for coverage for those who are absent when no substitutes are available. Ms. Walker told me that Sandra has been making lesson plans and teaching when she doesn't have her own classes for two teachers who have left for the rest of the year. This must be standard procedure, but I am shocked that a second-year teacher must take on coverage for those who are out indefinitely until replacements are hired. I am quite concerned for teachers like Sandra who are excellent beginning teachers given so many responsibilities that they can no longer do the job for which they were hired with any degree of excellence or creativity. (Greene Observer Journal, Y3, #1, p. 4)

And, like the teachers in economically stressed schools, teachers at Greene could not envision an end to the stress.

Rockford Middle School

Rockford Middle School's principal held the reins of power tightly, giving teachers little decision-making power in their classrooms or in any aspect of the school. Teachers felt that her tendency to clamp down tightly on teachers was exacerbated by the fact that she was inconsistent in her exercise of power. She maintained an equally inconsistent relationship with the study, offering her assistance and support at one moment, and then telling teachers that they should only *pretend* to participate in the study in the presence of researchers. "I am struck by how different she can be at different times. She is so cold and aloof one minute, then all smiles and helpfulness the next" (Rockford Observer Field Notes, Y3, #1, p. 1). The principal not only avoided attending staff development meetings, but she often did not show up for scheduled meetings with the coach and did not follow through on promises that she made to the coach.

> I met with the principal in her office. I flat out asked her whether or not she gave permission slips to all of the students. She said that she had not given them to the LD students or the kids below the 30th percentile . . . . She didn't think that they needed more testing. I said that she compromised the study and she said that last year, they had to twist arms to get the kids to bring back permission slips and that she wasn't going to do that any more. I told her that I didn't think that they did that last year. She said the parents weren't enthusiastic, because they only saw the kids being tested. I asked if she had explained to the parents the benefits, but she had not. (Rockford Observer Field Notes, Y3, #2, p. 1)

Her verbal support of the program was inconsistent, and her behavioral support of the program was almost nonexistent.

> I got to school and checked in. I asked Dana, the librarian, if the principal had sent out an email about the students I was supposed to be interviewing, but she hadn't. So we created one together, but I needed to go and find the sixth graders.

> By the time I rounded them all up, it was 8:30. (Rockford Observer Field Notes, Y3, #3, p. 1)

With messages from the principal that they needed only to *fake* participation in the study, it is little wonder that few teachers at Rockford worked with any great consistency or success toward using differentiated assessment in their classrooms. While the supportive and encouraging coach at Rockford did manage to enlist the effort of a few Rockford teachers, she could not fully break through the general atmosphere of apathy and acceptance of mediocrity that plagued Rockford, a tone that seemed to be set by the principal.

> I also asked them to think about a task they would be interested in doing and getting their thoughts together so that we could discuss that during the staff development day. Christina made a comment about the tasks that we have and said while they were nice, they didn't match what they had to teach . . . . The eighth grade team meeting was even less productive than the seventh grade meeting. They really have no input or questions. Tara Mutchler did want to know about the testing so that they could plan. They had not been told about any of it by the principal. I told her that I would send them a list of students and the dates that the principal had requested for the testing. They did not know about the in-service day we had planned, and after being told, Sue and Beth indicated that they would not be there . . . Kim did not say anything. Beth indicated that they really needed to go and help set up some "social" event that was happening after school that day. I left. (Rockford Observer Field Notes, Y3, #6, pp. 3-4)

Coaches' Experiences

Coaches' experiences in schools like Howard, Greene, and Rockford indicate that positive administrator support of a change initiative and the teachers involved in it encourages teacher participation in the initiative. Administrator behaviors that facilitate change in teachers' practices in the study school are

1. Showing support for the change initiative by attending staff development meetings, emphasizing the importance of teacher participation in the study, cooperating with coaches and providing them with access to school members, and understanding the change initiative in order to provide feedback to teachers;
2. Creating safe environments that encourage teachers to take risks and try new things in the classroom, including (a) understanding the difficulties inherent in undertaking changes in teaching practices, including fear of failure, reluctance to abandon familiar classroom routines, confronting potential areas of weakness; (b) providing teachers with time to plan and opportunities for collaboration; and (c) providing teachers with necessary resources; and
3. Establishing a "community of learning," in which all school members are regarded as on-going learners—and understanding that mistakes are inherent in the learning process.

Individuals in formal positions of power (such as administrators) were not the only school members whose attitudes toward the study affected teacher participation. In many of the study schools, coaches discovered that informal power structures existed that needed to be negotiated in order to gain access to teachers' participation. Coaches discovered individuals who occupied informal positions of power. These were individuals—sometimes teachers, sometimes secretaries, sometimes gifted coordinators—who held the key to accessing the trust and cooperation of other teachers. Often these individuals were informally "assigned" this power by the principal and the faculty by virtue of their longevity with the school, but in some cases the individuals acquired their status through simply being "likeable" or "popular" among faculty members. Individuals possessing informal positions of power were not, therefore, necessarily the most capable leaders in their school communities.

While these individuals were certainly important in all of the sites as resources to tap when trying to encourage teachers' participation, these individuals were *critical* in sites where the administrators remained removed from the study. In the absence of strong administrator support of researcher presence in the school, winning over those individuals occupying informal positions of power was crucial to gaining access to teachers' trust.

At Marshall Middle School, where the principal kept researchers at arm's length, these teacher-leaders had a particularly strong influence—both positively and negatively—on the participation of other teachers in the school. Initially, the seventh grade team at Marshall resisted the performance assessment initiative, avoiding the coach and refusing to try performance assessments in their classrooms. One of the seventh grade teachers, Bonnie Whittaker, briefly showed interest in trying performance assessments, but soon shut out the coach. The coach discovered that Mary Holland, the team leader, was upset by the project and had convinced the other team teachers to "boycott" the study. When Whittaker showed interest in participating in the study, "Holland was furious. She didn't want Whittaker to be talking to me. Everyone on the team listened to her and so Whittaker stopped talking to me" (Marshall Coach Reflection, Y3, #1, p. 3). Later, once the coach had won over Holland by providing her with materials that she wanted, Holland (and consequently the entire seventh grade team) became more cooperative.

Conversely, the sixth grade team leader at Marshall, Emily Ashburn, was an example of the positive ways in which teacher-leaders can affect an initiative. "The sixth grade team would do whatever she said. If she said, 'Let's try it!', they'd do it" (Marshall Coach Reflection, Y3, #1, p. 3). The coach described Ashburn as a "motivating force" for teachers because she was so well-respected by the other teachers. Ashburn's enthusiasm for the project, coupled with her informal position of power on the team, instantly allowed the coach access to the trust and cooperation of the other team members.

At Greene Middle School, the second principal showed little true interest in exerting great personal effort toward ensuring the success of the NRC/GT differentiation

initiative. An assistant principal stood in her stead for administrative details, but resented the extra duties that she felt the study imposed upon her. Most of the responsibility for enlisting teachers' support rested upon Nancy Wyman, the appointed liaison between the teachers and researchers. Nancy Wyman was a powerful force among the teachers. However, as teachers became less and less available—and more and more actively avoidant of the coach—the coach began to suspect that the liaison was deliberately sabotaging the project. The coach sensed that Wyman felt her power threatened by the project, and feared that the project's success in changing teachers' practices would undermine her authority.

The presence of outsiders in schools may be perceived as a potential threat to individuals in informal positions of power, as well as to those whose power positions are more formal. Because their power is not "official" and is often based on peer and administrator perceptions of competence, the introduction of new instructional techniques may cause teacher-leaders to be fearful that these new techniques may make them look incompetent. Comfortable in their roles as leaders, these teachers may see no reason or personal benefit to the proposed change and may consequently try to keep these changes out of their schools.

General school atmosphere also affects school members' prioritization of a change initiative. In three of the study schools, school members felt that the deep-seated problems at their schools made change impossible. In each case, the school primarily served students from a largely disadvantaged population. The administrators and teachers (and often the students as well) identified the school's troubles as emanating from the nature of the student body—"unmanageable," as one teacher described it, "tough," as a student described it. School staff members felt that most of their energies were devoted to attending to the needs of their student population—often, needs unrelated to academic issues:

> Saunders wasn't able to interview today. A parent conference interfered with our scheduled time. During the parent conference, I saw Saunders in the hall . . . she said, "I'll be glad as hell when this day is over." Later in the day, Saunders explained that when I saw her in the hall she had been looking for the student whose mother was in conference. Saunders also explained that during the conference they had talked about the girl's sexual activity. Apparently, the parent acknowledged the behavior, but said the girl was out of control. The girl is a sixth grader. Earlier in the morning, Saunders told me about another sixth grader the school is dealing with. The girl failed sixth grade last year because of 150 plus days of absences. Today, while I was observing Saunders, the school system's visiting teacher escorted the girl into the room. The student was being returned to school on a court order because this year she had already missed 70 days of school. (Haden Coach Journal, Y3, #8, pp. 1-2)

Additionally, in such schools, teachers identified the administration's ineffectiveness in controlling the student body and leading and supporting teachers as contributing factors to the school's larger problems:

> Both teachers continued to express their frustration and anger over students disrupting classes and about the continuing changes in administration at the school. They also spoke about the seeming powerlessness of the administration to manage the school. Kelly described her impression of the situation by telling the story of when she gave the assistant principal a "set of balls." Apparently, before Kelly actually gave him the two balls she informed the principal of her plan. The principal then called him to the faculty lounge where Kelly gave him the set. Then Jenny, reportedly, made a derogatory comment about his need of "balls" in order to handle the Haden students. (Haden Coach Field Notes, Y3 Summary, p. 1)

In turn, administrators in struggling schools often cited *teachers'* inexperience, incompetence, and inability to control students effectively as complicating the schools' efforts to appropriately serve their student populations. Many felt that effective, experienced teachers wouldn't work in troubled schools.

> Our conversation shifted to other "risk" factors that confront Parkway. She told how most teachers quickly leave Parkway because of the taxing requirements of its clientele. She spoke of presently working through the system to fire a new teacher before the year was over because of the teacher's incompetence. The teacher had been hired because of the limited number of qualified candidates willing to teach at Parkway. She described Parkway's faculty as inexperienced teachers who give the school energy, but who do not have the experience required to manage and educate an "at-risk" population. (Parkway Coach Journal, Y2, #2, p. 1)

Clearly, in such turbulent school environments where relationships between the administration, teachers, and students are tense and unrelieved by effective communication or mutual respect, school members' energies are focused on day-to-day, immediate "getting by" concerns. In these environments, where basic survival is the primary concern, school becomes a place of struggle, struggles which many school members feel they are losing. When a coach asked teachers and students to give a metaphor to describe their school experiences, he received these responses:

> In her last interview for '97-'98, Meiners described teaching as a garden. When I asked her to elaborate, she told how her garden was continually pounded by forces outside of her control. In the metaphor, she perceived herself as one of the plants in the garden . . . Hibbard described teaching as a war. She then narrowed the metaphor to say that it was the Vietnam War. Teachers were winning some battles for the minds and hearts of students, but ultimately the war would be lost . . . . The teachers are not the only ones feeling the stress in Haden's environment. The students are also being impacted and recognize the deteriorating conditions. In interviews, students gave the metaphors of "a jungle" and "a swamp" as descriptives of their school. (Haden Coach Field Notes, Y2, Summary, p. 4)

Indeed, the hallways and classrooms of these schools did often resemble a battleground where students and teachers were caught in a cycle of testing, exerting, and resisting power.

As a result of these stressful conditions, teachers in such schools often perceive themselves as caught between an administration that renders them powerless and unsupported, and a student body that is difficult to manage and even antagonistic. Under these threats, teachers often find themselves growing less willing to devote the extra time and effort necessary to effect the types of changes they would like to see. They feel themselves rendered powerless as agents of change by the larger struggles of the school, and even many of the very dedicated essentially give up:

> Meiners was particularly talkative about her professional career. She was anxious to express concern that during the last school year she had not been her best at teaching . . . she also said she was ready to quit her role as Pre-IB coordinator. This is significant because Meiners began the program and has nursed it through its years of development. She has not been paid for the effort, is disappointed with the support it receives from the local administration, and is upset that the central administration is "reaming her ass" (her words) over the operation of the program. She said she felt like a missionary in her present position and was ready to just be a teacher. Meiners appears to desire professional growth and wishes to find a means to settle the troubles at Haden. She seems to be cornered, though. I believe her ability and desire to take the risks of change is strangled by the day-to-day battles of low teacher morale, ineffective administrators, and unmanaged students. (Haden Coach Journal, Y2, #4, pp. 1-2)

Initially, for teachers who were working in these embattled and struggling schools, participating in the NRC/GT study was perceived as just another burden that they had to bear. Teachers did not initially recognize the relevance of the study to the deeper issues of poverty and student discipline with which their schools were contending.

> Walker led the effort to keep our NRC project out of Haden. On Friday, when we discussed why she had not wanted the NRC in the school, Walker implied that she just didn't believe that any UVA people could come into their school and offer a means to effectively deal with Haden's broader issues. Furthermore, she did not want the additional burden of "others" being a part of her school day. I think she is simply overwhelmed with her daily existence at the school. (Haden Coach Field Notes, Y2 Summary, p. 3)

In these schools where teachers felt largely unsupported by the administration in their efforts to effect change in their classrooms and in the school and discouraged by the low achievement and motivation of their students, teachers seemed to perceive their schools as unprepared for taking the risks associated with change. Instead, they believed that their focus—and the schools'—needed to be on meeting basic needs such as safety, social, and behavioral needs.

CHAPTER 7: Conclusions and Recommendations

This study began with recognition of the complexities of addressing the diverse needs of all students in middle schools. Many educators of the gifted, recognizing the often unmet needs of bright learners, advocate for programming that provides rigorous curriculum and instruction through a variety of delivery options, ranging from pull-out programs to specialized programs for gifted learners in special classrooms or special schools. Middle school advocates seek to eliminate the labeling of students, believing that such designations unfairly separate students, create high status and expectations for some students and low status and expectations for others, and thereby affect adolescent learners' self-esteem and ability to establish peer relationships. Consequently, an increasingly popular service delivery option in middle schools is an inclusive approach, in which general education teachers address all students' needs, including those of the gifted, within the regular classroom. While this approach may eradicate the negative consequences of labeling students, it is accompanied by a host of new challenges for teachers, prompted by the presence of an extremely diverse group of students in one classroom.

There are many possible responses to this challenge. One approach is to ignore the evident academic, language, and ethnic diversity in middle school classrooms, assuming that equity emanates from identical curriculum and instruction for all learners. However, this approach is ineffective and borders on the unethical, as ignoring student differences results in boredom, frustration, and school failure for many and a good fit for few. Another possible approach is to abandon heterogeneous grouping in middle schools, concluding that diverse classrooms cannot be run effectively. This solution, however, is contrary to the current political focus on educational equity for all learners and ignores the reality that even so-called "homogeneous" classes contain a great deal of cultural, socioeconomic, and academic diversity.

Both of the above approaches assume that diversity in the classroom must be dealt with by either diminishing or ignoring it. A third approach is to find ways of recognizing and responding to the varied educational needs of all students, including the gifted, in heterogeneous classrooms. Seemingly simple, this solution challenges many of the basic but powerful assumptions that have shaped and informed the nature of education for many years, assumptions about the responsibilities and roles of students and teachers in the classroom, about how and what students should learn, and about the ways in which student differences should be addressed.

Accepting the challenge of the issues surrounding differentiation in heterogeneous classrooms, this study sought to examine the feasibility of promoting challenging curriculum, instruction, and assessment for the varying learning needs of the wide range of learners in contemporary middle school classroom. Two interventions were proposed to assist teachers with addressing academic diversity. First, a "front-door approach" was examined in three schools. In this approach, teachers were directly instructed and coached in the principles and application of differentiated instruction. A second

approach, the "back-door approach," provided teachers instruction and coaching on differentiated assessment techniques with the premise that recognizing student variability through differentiated assessment would provide insight into learner differences and motivation for the teacher to differentiate instruction.

Three years of data collection and 5 years of quantitative and qualitative data analysis led to conclusions about the nature of the journeys upon which teachers and schools embarked as they considered alternative approaches to meeting the needs of the broad range of learners in their classrooms. The study's findings are summarized below, followed by recommendations for practitioners.

Complexities Inherent in Learning to Differentiate Instruction and Assessment

Differentiation of instruction and differentiation of assessment are complex endeavors. As one participating teacher observed, "You can't just decide you are going to differentiate one day. It is a step-by-step process" (Snowe Interview, Y3, #7, p. 12-13). Teachers face many challenges while learning to differentiate instruction, including the time required to create multiple learning experiences for different students; the need to facilitate numerous small groups engaged in different tasks; the complexity of creating multiple learning activities tied to the same concept, skill, or understanding; the shift in teacher role from front-of-the-room control to one of facilitation of student learning; the deep understanding of a discipline necessary for providing appropriate levels of challenge to all students; and the task of juggling several seemingly conflicting curriculum initiatives (e.g., aligning differentiation with standards-based instruction) in the classroom at once.

Similarly, differentiation of assessment presents teachers with many challenges, including the time it takes to create multiple assessment options for different students; the complexity of creating rubrics articulating indicators of different levels of performance on the essential skills and understandings of a discipline; the need to delineate what students should know, understand, and be able to do prior to designing curriculum and instruction; the task of recognizing appropriate levels of challenge for students; learning to use assessment results to guide further instruction; and reconciling authentic assessment approaches with preparing students for the more traditional high-stakes state tests.

On their own, differentiation of instruction and assessment are complex endeavors requiring extended time and concentrated effort to master. Add to this complexity current realities of school such as large class sizes, limited resource materials, lack of planning time, lack of structures in place to allow collaboration with colleagues, and ever-increasing numbers of teacher responsibilities, and the tasks become even more daunting.

Most challenging, perhaps, to teachers' use of differentiated instruction and assessment in the classroom is the fact that the philosophy of teaching and learning underlying these approaches conflicts with the deep structure beliefs about school commonly held in our society. Traditional approaches to curriculum, instruction, and assessment clash on several fundamental levels with differentiation. Table 77 illustrates the oppositional nature of the deep structure beliefs that define traditional approaches to school and those underlying differentiation of instruction and assessment.

Table 77

Deep Structure Beliefs

Deep Structure Beliefs	Beliefs Underlying Differentiation of Instruction and Assessment
The teacher is at the center of the classroom.	The student is at the center of the classroom.
A single curriculum is appropriate for all learners.	Multiple curricular and instructional approaches are necessary to meet individual student needs.
Discussions of student differences are avoided except as explanations for different levels of achievement.	Student differences are acknowledged in instructional planning and appropriately responded to.
The teacher's responsibility is to direct learning.	The teacher's responsibility is to facilitate learning.
Curriculum and instruction are pre-determined by a curriculum guide, textbook, standards, or established teacher routine.	Curriculum and instruction are responses to demonstrated student need.
Student success or failure depends on how well that student can work within a pre-determined curricular and instructional approach.	Student success or failure depends on how well curriculum and instruction meet that student's needs.
Assessment is summative and used to compare student to student.	Assessment is formative and summative in that it guides instruction and is also used to measure student learning.

The ways in which teachers respond to individual differences in the classroom is central to the conflict between traditional deep structure beliefs and differentiation of instruction and assessment. In traditional approaches to teaching, teachers treat all students as though they are basically the same. Teachers often adhere to pre-determined curriculum and instructional sources, such as teaching routines developed over the years, textbooks, content and/or achievement standards, or curriculum guides in making decisions about instruction and assessment and typically avoid responding to student differences for fear of treating students differently, and hence, "unfairly." This approach assumes that all students' needs can be met through one curriculum, one instructional

method, and one form of assessment with only minor modifications, such as extra review and practice for struggling learners. Success and failure in school are dependent on a student's ability to work within these traditional structures, rather than on the teacher's capacity to modify the structures to accommodate the student.

In contrast, in a differentiated classroom, teachers respond to each student according to his or her individual needs while maintaining a common base of learning goals. No single curriculum or instructional or assessment method is assumed to be appropriate for all learners; curriculum, instruction, and assessment must be flexible to accommodate a wide range of learners. Success and failure in school indicate whether or not the provided instruction and assessment are appropriately matched to the needs of a particular learner. In the differentiated classroom, student differences are at the center of a teacher's decision-making processes.

The vast majority of participating teachers began the study reporting traditional approaches to teaching and learning, such as direct instruction and lecture and the whole class doing the same seatwork, approaches that remained throughout the study for the vast majority of teachers. Many aspects of differentiation of instruction and assessment (e.g., assigning different students different work, promoting greater student independence in the classroom) challenged teachers' beliefs about fairness, about equity, and about how classrooms should be organized to allow students to learn most effectively. As a result, for most teachers, learning to differentiate entailed more than simply learning new practices. It required teachers to confront and dismantle their existing, persistent beliefs about teaching and learning, beliefs that were in large part shared and reinforced by other teachers, principals, parents, the community, and even students. The combination of the inherent complexity of differentiation with the ingrained nature of traditional deep structure beliefs about school often made encouraging large-scale changes in most teachers' practices difficult, if not impossible.

Teachers' Responses to Differentiated Instruction and Differentiated Assessment

Despite the difficulties inherent in the task, most participating teachers made at least some effort to add differentiation practices to their existing teaching repertoires. A few made significant alterations not only to their practices, but to their visions of teaching and learning as well. The variation of teacher responses to differentiation is examined below, along with potential explanations for the variations.

"Surface-level Differentiation" in Differentiation of Instruction Sites

Most participating teachers were observed trying "surface-level differentiation" at some point in their classrooms, intermittently trying new strategies (such as using cooperative learning groups occasionally, allowing students to choose from a list of different learning activities, employing learning stations from time to time), but were resistant to practices that challenged their basic (if sometimes unexamined) beliefs about

teaching and learning. Teachers generally began differentiating instruction by occasionally allowing students to choose from a variety of tasks geared toward different student interests and learning profiles. Typically, when teachers differentiated by learning profile, they created sense-making activities (activities designed to help students process content) geared toward different "intelligences"—(e.g., provided a choice between making a poster, writing a song, creating a model, or writing an essay). Based on our observations, the most frequent method teachers used to differentiate according to interest was to allow students to choose a topic to research from a list of possible topics. While these activities afforded students greater decision-making opportunities, they were not always centered on a common or unifying skill, understanding, or concept. Frequently, observations of teachers indicated that teachers varied activities for the sake of varying them, rather than to give students multiple ways of exploring the same idea or concept. While these attempts at differentiation were for the most part shallow, they did provide students with occasional choice and variety in the curriculum. Additionally, these teachers were comfortable with this level of differentiated instruction and believed that these changes represented improvement to their practices. Only a few progressed beyond this level. Quantitative data indicate that most teachers, when they varied their instructional strategies at all, employed various instructional strategies (e.g., learning contracts, tiered assignments, curriculum compacting, learning/interest centers, flexible grouping) more frequently to meet the needs of struggling learners. However, most teachers reported seldom or never using these same instructional strategies to meet the needs of advanced learners. The vast majority of students reported that they never were allowed to skip an assignment because they already knew the material and never received different assignments or used different materials than other students in the class.

Many teachers expressed discomfort with assigning certain students more complex work than others, revealing underlying beliefs that it is necessary to disguise or ignore individual student differences in academic readiness. As a result, few teachers attempted to differentiate instruction according to readiness level. However, some teachers reconciled their desire to differentiate instruction according to readiness with their more traditional beliefs about the need to camouflage differences by modifying differentiation practices in ways that allowed alignment with their traditional beliefs. For example, some teachers felt comfortable varying students' assignments according to readiness as long as all assignments "looked the same," hoping that students would not notice the differences between their assignments and those of their neighbors. Other teachers were observed creating tasks of varying difficulty but then allowing students to choose which tasks they wished to complete, not wanting to acknowledge their own awareness of differences in student readiness by assigning tasks to students. Such modifications to differentiation practices allowed teachers to feel satisfied that they were differentiating instruction for student readiness, but did not force them to act in ways contradictory to their deep structure beliefs. Many teachers were willing to try surface differentiation, such as providing choices of topics or materials, while being observed by researchers and coaches. However, quantitative data from both teachers and students indicate that these changes were not implemented on a consistent basis. The majority of teachers reported seldom providing students with choices in topics of study or assignments to complete, a finding confirmed by student survey data.

"Surface-level Differentiation" in Differentiation of Assessment Sites

Teachers in the assessment sites struggled more with making changes to their practices than did their colleagues in the differentiated instruction sites and were, in general, more resistant to the study. The fact that fewer changes in teachers' practices and greater resistance to the study were evidenced in the assessment sites than in the differentiated instruction sites may be attributable to a few key factors identified by both the qualitative and quantitative data:

1. Overall, the assessment site schools were more "troubled" than the differentiated instruction schools. That is, these schools were observed to have less stable environments, fewer resources, and less supportive administrators. Teachers also generally held lower expectations for students in assessment site schools. School climate and organizational change survey data (see Moon, Brighton, & Callahan, 2003) echo these findings.

2. The goals of differentiated assessment appeared to teachers to clash with the goals of state testing mandates in very obvious ways. Teachers in states with traditional, high-stakes testing systems expressed discomfort with using authentic assessment in the classroom when they felt pressured to prepare students for multiple choice high-stakes state tests.

3. Almost any use of differentiated assessments in the classroom requires teachers to confront politically charged, controversial issues (e.g., grading, testing, student diversity) immediately. As a result, it is more difficult to employ "surface differentiation" with differentiated assessment than with differentiated instruction.

4. Beliefs about grading and testing are among the most entrenched beliefs that teachers have (Cross & Frary, 1999; Frary, Cross, & Weber, 1993). Asking teachers to change their approaches to these aspects of schooling is, therefore, the most troublesome for teachers. Interestingly, while teachers in differentiated instruction sites felt uncomfortable drawing attention to student differences through curriculum and instruction, when it came to assessment and grading, many teachers in both the differentiated instruction and assessment sites clung to traditional methods designed to highlight student differences through student-to-student comparisons on identical assessments. Many participating teachers balked at the idea of providing different assessments to different students, particularly when it came to grading students on different assessments linked by the same concepts, principles, and generalizations. While most teachers agreed that it was important to give students multiple ways of expressing what they knew, they could not justify grading students on tasks that they perceived as unequally challenging.

Traditional school notions of "fairness" dictate that all students must be graded on identical assessments. Such beliefs about fairness evolve out of a system in which assessments provide information used to compare one student to another—typically using grades. These deep structure beliefs about fairness often complicated teachers' attempts to differentiate assessment, an approach which stresses individual growth over student-to-student comparisons. While quantitative and qualitative data indicate that many teachers believed that recording individual student effort and growth was important, most felt pressured by students, parents, and school expectations to assess in traditional ways.

Most assessment site teachers felt comfortable using "surface differentiation," providing several assessment options differentiated by student interest or learning style (e.g., allowing students to make a video, write an essay, or create a collage to express an understanding), practices that some teachers acknowledged they had already been using prior to the study. Few, however, made attempts to move beyond surface-level differentiation for student assessment. Like the teachers in the differentiated instruction sites, some assessment site teachers attempted to reconcile their desire to differentiate assessment with their more traditional beliefs about school by modifying differentiated assessment in ways that made them align with their traditional beliefs. When teachers tried the differentiated assessments they created in collaboration with the coaches, some expressed the belief that the provided assessments were too difficult for even their most advanced students. Some modified the assessments by eliminating steps, making them less challenging, and getting rid of what they perceived as inequities in the assessments. Many of the teachers perceived the multi-facetedness of the more advanced assessments as entailing "more work" than the assessments for other students, and feared that the advanced students would complain about unfairness. By modifying the assessments, teachers were able to use what they perceived to be differentiated assessments in ways consonant with their deep structure beliefs.

Interestingly, it was more prevalent in assessment sites than in the instruction sites for teachers to cite the deep structure beliefs of *others* (typically, students and parents) as complicating their attempts at differentiating assessment. Teachers noted worrying that parents would react negatively to students being graded on tasks of varied difficulty. Concerns about differentiated assessment revealed how politically charged teachers perceived their decisions about assessment to be, a perception which very likely complicated their willingness to differentiate instruction.

When implemented completely, differentiation of instruction and assessment require teachers to overhaul not only their practices from the ground up, but also often force an overhaul of their teaching philosophies. It is possible to do "surface-level differentiation" without confronting deep structure beliefs, and most teachers in the study made at least a few attempts at surface-level differentiation. However, most teachers resisted engaging in the deeper philosophical struggles necessary to differentiating instruction and assessment, such as considering new ways of grading students or reexamining their prior beliefs about the ways in which students learn most effectively.

Consequently, we saw many "Accessorizers:" Teachers who were willing to add differentiation-based strategies to their repertoires, but who were not ready to undertake an overhaul of their teaching philosophies. Most participating teachers in both the instruction and assessment sites ended the study differentiating instruction and assessment on the *surface* level, using self-selected differentiation strategies that aligned with their existing teaching paradigms and rejecting those that did not, rather than modifying their beliefs to align with the innovations.

Using surface differentiation allowed teachers to add innovative practices to their teaching repertoires without significantly altering the structure of their classrooms or confronting their deep structure beliefs about teaching and learning. Therefore, while some of the teachers' practices changed, their central philosophies about teaching, learning, and students remained intact. Even though they were limited, the changes that these teachers made to their instructional and assessment practices were positive and represented steps toward more student-centered classrooms.

Most importantly, even teachers' surface-level attempts at differentiation positively impacted students' classroom experiences. Teachers noted that allowing students choices produced increased student interest and engagement in learning. Teachers in assessment sites expressed pleasure and surprise at how well struggling students performed when provided opportunities to express understandings through non-traditional assessment forms. Significantly, witnessing the positive impact that differentiation had on students motivated teachers to want to continue using differentiation practices in their classrooms. Whether some of these teachers may have eventually begun making deeper-level changes to their practices with longer-term coaching and support cannot be determined; however, this possibility affirms the beliefs of some change theorists (Bascia & Hargreaves, 2000; Fullan, 1995; Joyce & Showers, 1996; Lortie, 2002), and warrants further investigation.

"Deep Structure Differentiation" in Differentiated Instruction and Differentiated Assessment Sites

The few teachers in differentiated instruction and assessment sites who made significant strides with differentiation entered the study with student-centered teaching practices and beliefs that aligned with the initiatives and/or experienced discomfort with their prior teacher-centered practices and beliefs as they encountered the "new" vision of teaching and learning that differentiation offered. These feelings of discomfort prompted these teachers to begin making deeper-level changes to their teaching practices, changes such as differentiating assignments according to readiness level, assessing students with rubrics, and allowing students to progress through material at their own paces. These teachers began the process of actively reconstructing the systems at work in their classrooms, confronting charged issues such as grading, individual differences, and questions of equity. The types of changes they were enacting in their classrooms represented dramatic departures from traditional approaches to school. Only a few teachers were ready to undertake "deep structure differentiation," but that any were is

significant when considering the immensity of the task of tackling differentiated instruction and assessment and the complexity of teaching.

Teachers' resistance to confronting deep structure beliefs is understandable. Traditional deep structure beliefs are tacitly shared among many members of our society and define the way we "do school." Many administrators, other teachers, parents, and even students expect teachers to conduct their classrooms in accordance with these beliefs. Deviating from these expectations is risky. Deep structure beliefs are stubborn and complex, deeply rooted and widespread, but they are not insurmountable. Looking at the cases of teachers who did succeed at moving beyond surface-level differentiation to using deep structure differentiation in their classrooms gives us insight into the factors that supported and hindered teachers during their change journeys.

Factors That Support or Hinder Teachers' Journeys Toward Differentiation

Several factors contributed to why some teachers were willing and able to employ differentiated instruction and differentiated assessment on a deeper level than others. The time allotted to and the intensity of the change initiative, the support that teachers received from their principals while engaged in the process of change, contextual factors, such as teachers' own internal factors, and the nature of state mandates all influenced teachers' change efforts.

Impact of the Study Design on Teacher Participation

Two factors of the study design in particular influenced teachers' participation in the study: time and a coach's proximity to school. The duration of the study was not sufficient to see wide-scale changes to teacher practices. Change literature suggests that it takes a substantial amount of time to begin to enact real change in a school (Evans, 1996; Tyack & Cuban, 1995). However, the changes that we did witness over the course of 3 years were encouraging.

The second complicating reality of the study design was that our coaches were off-site coaches. There is a saying that in order to change, an individual must either feel the heat or see the light (Fullan, 1993). While it is our belief that the on-going training and coaching in differentiated instruction and assessment provided moderate light for many teachers participating in our study, our bi-monthly visits to teachers' classrooms could not provide the heat to motivate teachers to make changes to their practices. Because the nature of off-site coaching prevented coaches from being a constant, visible presence in the schools and the coaches were not school personnel with authority gained through position or reputation, our study often took a back seat to the other more pressing and immediate concerns with which teachers were confronted daily. Having a knowledgeable and committed advocate for the study on site seems crucial to garnering the enthusiasm of teachers and encouraging their on-going participation and growth.

Impact of Principals on Teacher Change

Principals affected the participation of teachers in two ways: first, a principal's reaction to the study influenced the nature of teachers' responses to the study. Second, the nature of a principal's leadership style often shaped the dynamics of a school culture, affecting whether or not a teacher in a school was open to and ready for change.

Impact of Principal's Response to Study on Teacher Participation

Quantitative and qualitative data sources overwhelmingly support the notion that a school's principal can be a powerful catalyst for substantial changes in teachers' practices. However, not all principals wished or were able to be active advocates for the study. Principals' responses to the study varied dramatically, from enthusiastic, consistent support to active obstruction of it. In the schools in which principals were advocates, teachers tended to participate more consistently and show more growth. The principals who were most effective in involving teachers in the study displayed on-going interest in and commitment to the study. Their involvement in the study went beyond giving it mere "lip service." They genuinely believed that their schools' participation in the study would lead to improved instruction and, more importantly, believed that their teachers were up to the challenge of differentiation. Such principals showed support of the study (and of their teachers) through their actions as well as through their words, actively participating in staff development sessions, providing incentives for teacher participation in the study, and giving teachers extra planning time to work on differentiation. Both through their words and their actions, these principals conveyed the importance of differentiation to their faculties.

Principal Leadership Qualities That Supported Teacher Change

The nature of a school's culture (the general climate of the school, relationships between community members, goals of the school) also influenced teachers' participation in the study. Survey data collected indicate that schools with more positive climates and cultures were more likely to have teachers who were willing to consider innovations (Moon, Callahan, & Tomlinson, 2003). Principals had tremendous influence on the nature of this culture, impacting teachers' practices and, consequently, what and how students learned. Certain qualities of a principal's approach to leadership encouraged greater teacher participation in, commitment to, and growth during the study. Such principals

1. believed change to be a necessity in maintaining the health and effectiveness of a school and faculty,
2. responded to the varied needs of participating teachers,
3. were instructional leaders, understood general pedagogy, and participated in in-services to gain knowledge about differentiation,
4. encouraged risk-taking as part of professional growth,
5. held high expectations of teachers, and

6. maintained a balanced focus on external indicators of success (such as scores on high-stakes tests) and more authentic measures of student understanding.

Two of these elements of principal leadership were particularly influential in shaping the nature of teacher participation in the study: how the principal defined school success, and the level of his or her understanding of differentiation of instruction and assessment.

Impact of principals' definitions of school success. In schools where the principal laid heavy stress on the importance of doing well on external indicators, teachers tended to focus instruction narrowly on what was to be tested and to leave less space in the curriculum for attending to student differences. In these sites, teachers also felt pressure to match assessment formats to those of the state tests. Teachers in these schools often complained that they had little control over what they taught and how they measured what they taught. As a result of teachers feeling tied to a prescribed curriculum and rushing to get through it, most class time was occupied by teacher talk and whole-class activities. In these environments, students had little time to make contributions in class, interact with other students, or make decisions or choices about what and how they would learn. Many teachers expressed that the pressure they were experiencing from administrators to get students to pass state tests prohibited them from making any but infrequent, surface attempts at differentiation.

In schools where principals considered external indicators of success important, but not all-encompassing, and student growth and understanding were concurrent goals, teachers tended to voice more feelings of control over what they taught and when they taught it. As a result, they tended to devote more class time to on-going projects and in-depth investigations of topics (in this study, these schools were all differentiated instruction sites). These teachers also tended to give students more choice about what they would learn and how they would demonstrate what they learned and more frequent opportunities to work with one another. Not surprisingly, it was in these classrooms that we saw teachers attempting to implement differentiation of instruction with the greatest frequency and with the least clash with their prior practices and philosophies.

Impact of principal's knowledge of initiative. Few of the principals in the study possessed a thorough understanding of differentiation of instruction or assessment. Most were conversant in the basic principles of the initiatives, but lacked the deep understanding necessary to recognize when teachers were misinterpreting differentiation practices in the classroom. Consequently, most principals were unable to provide feedback on teachers' use of differentiation or guide them to the next level of implementation. Those principals who themselves had deeper understandings about differentiation and its rationale were more effective in engaging teachers in conversations about their work and in providing teachers useful feedback about their work.

Because principals have a tremendous impact on the willingness of a faculty to undertake change, a principal committed to and trained in differentiation can serve as a powerful agent of change. Off-site coaches can provide teachers with feedback and

encouragement during the change process, but lack the power of accountability to mandate certain practices and timelines. To provide teachers with the on-going, informed support that they need, the on-site presence of an individual combining both power and knowledge of the initiative is necessary. On-site coaches provide one source of impetus and guidance for change, but a principal who is thoroughly trained in the initiative is most likely a key factor in effective approaches to supporting and encouraging teacher change—this individual has both the power of accountability and the power of knowledge, the ability to be both a light source and a heat source for teachers engaged in the change process.

The Impact of Contextual Factors on Teacher Implementation

In both interviews and surveys, when identifying factors that complicated (and, in some cases, prevented) differentiating in the classroom, many teachers described contextual factors—factors such as large class sizes and overcrowded rooms, lack of time to collaborate with other teachers, the pressure of standards and high-stakes tests, lack of budgetary and material resources—that they felt were essentially out of their control. Teachers cited planning time as a particularly limiting factor, and noted that having time to collaborate with other teachers helped them wrestle with the complexities of differentiation and provided a network of support during the change process.

Most teachers claimed that removal of contextual impediments would allow them to successfully implement differentiation. Many teachers voiced the belief that differentiation was a good idea in theory, but that it was unrealistic given the current state of public school classrooms. However, there were cases in which teachers, despite the presence of the same factors that hindered many other teachers' journeys, were able to progress beyond "surface-level differentiation" to "deep structure differentiation."

The Impact of Teachers' Internal Factors on Use of Differentiation

Many external factors influenced teachers' willingness and ability to differentiate instruction and assessment in this study, including the inherent complexity of the initiatives, the time given to make these changes, the support of principals, and contextual factors. The responses of teachers who successfully progressed beyond surface differentiation to these external factors provided interesting contrasts to the pattern of responses that defined the journeys of many of their colleagues. While other teachers frequently pointed out roadblocks that made implementation beyond surface differentiation "impossible," other teachers made noteworthy progress with differentiation despite the many roadblocks in their way.

Principal support, contextual factors, and the complexity of the initiatives are all external factors, factors that are a part of a teacher's environment, not a part of the teacher. How a teacher responds to change, such as the modification of a classroom to incorporate differentiation of instruction, had as much to do with the internal factors that a teacher possesses—factors such as beliefs about teaching and learning, depth of understanding of content area, handle on pedagogy and classroom management, and

definition of student success—as the external factors. The nature and strength of a teacher's internal factors affect how he or she responds to the many external factors that can complicate the change process. When teachers possessed fragile internal factors (e.g., beliefs about teaching and learning that clashed with those principles underlying differentiation of instruction and assessment, limited grasp of content area, poor classroom management skills), external factors easily impeded progress with differentiation. However, when teachers possessed strong internal factors, they were able to overcome even very powerful external factors that seemed insurmountable to others. The internal factors that impacted teachers' success with differentiation are discussed below.

The Alignment Between Teachers' Pre-existing Beliefs and the Philosophy of Differentiation of Instruction and Assessment

Teachers' pre-existing beliefs about teaching and learning, about the need to challenge students, about fairness, and about the goals of schooling affected their responses to differentiation.

Beliefs about teaching and learning. Teachers who came to the study with a more student-centered philosophy of teaching and learning were initially more receptive to the study, consistently more willing to try differentiation, and in the end usually more skilled in implementing it, as their practices already included more student-centered elements. These teachers had less difficulty embracing the type of flexibility and openness in their classroom that differentiation entails. Because their students were already accustomed to working in small groups, exerting some control over their learning, and having choices, student-centered teachers confronted fewer challenges when introducing differentiation into their classrooms. Further, student-centered instruction "felt right" to these teachers, and so they were open to taking further steps in that direction.

Teachers whose philosophies of teaching and learning were teacher-centered were more resistant to the study and more likely to find reasons why differentiation "would not work." For many of these resistant teachers, issues of control and classroom management concerns were frequently cited as presenting roadblocks to their implementation of differentiation in the classroom. Many did not believe that their students could handle the independence of working on different tasks. They felt that students would not learn as much when working independently or in small groups as they would if they were all being directly taught by the teacher. Most believed that allowing students to explore topics on their own was a less efficient manner of learning than when student knowledge acquisition was directly provided by the teacher. For many teachers, these deeply engrained, traditional beliefs about the ways classrooms should be organized to promote learning prohibited transforming their classrooms into the more open, flexible, and mobile environments required by differentiation. Many teachers acknowledged that less rigid, more flexible classroom environments were preferable for students, but contended that their students were not able to handle this lack of structure. Many teachers expressed

the belief that open classroom environments were most appropriate with advanced students but not viable for others.

Beliefs about success and challenge. Teachers tended to set uniform expectations for the class according to what the majority of the class could manage, defining "success" for students as "not failing." For many teachers, the gauge of whether or not their instruction and assessments were successful was whether students were enjoying the work and whether most students were passing. Consequently, providing challenge for students was not a focus in most classrooms. Many teachers expressed the belief that students, including gifted students, did not find challenging work "fun" and were prone to choosing the easiest way out when presented with tasks of varying levels of difficulty. Indeed, when teachers attempted lessons or assessments differentiated by readiness, many gifted students did initially balk at being presented with challenging tasks, unaccustomed to having to work hard in order to complete assignments. Students tend to "take the easy way out" when they work for external rewards (performance motivation) versus when they work because they want to know and because the work is satisfying (mastery motivation). We saw few classes in which the emphasis was on the joy of learning, personal choice, or pursuing interests. Therefore, the very nature of the classes became a self-fulfilling prophecy and a circular deterrent to challenge. Many teachers took students' initial resistance to challenging work as an indication that the work was too challenging. Lacking repertoires to support student acceptance of and pleasure in challenge, teachers abandoned efforts to differentiate instruction, returning to presenting all students with the same predominately low-level, low-interest tasks.

Even in honors classes, gifted students rarely received curriculum and instruction appropriate for their advanced needs. Gifted students spent most of their time in these schools (even in specially designated classes) underchallenged and unstimulated. Classroom observations repeatedly showed advanced students occupying their time after having rapidly completed their class work by reading a book, talking with friends, working on homework for other classes, or staring off into space. Frequently, when teachers made attempts at differentiating instruction by readiness, their efforts were geared toward supporting struggling learners through removing steps in a task, working closely with them, or providing less challenging reading materials. Rarely did teachers attempt to support struggling learners by having them work through areas of strength. The fact that teachers were more willing to attempt to address student deficits than strengths through differentiation by readiness carried consequences for gifted learners. Teachers rarely differentiated according to readiness for gifted learners, and the modifications they did make generally underestimated gifted students' abilities. Few teachers seemed to have developed the skill of making work for advanced learners richer and more complex rather than simply adding more work.

Beliefs about fairness. Deep structure beliefs about fairness impeded many teachers' abilities to implement differentiated instruction and assessment. Many teachers believed that fairness was only achievable when all students were working on the same tasks. Despite being presented with an alternate view of "fairness"—matching curriculum, instruction, and assessment to the needs of individual students—most

teachers were unable to abandon the belief that, despite evident differences in readiness levels, "fairness" is only evidenced when all students work on the same tasks. These beliefs about fairness were particularly difficult to reconcile with differentiation when it came to grading student work. Many differentiation site teachers who were, for example, willing to use tiered assessments or cubing activities balked when it came to grading these assignments. Many assessment site teachers voiced their belief that they could not justify—to themselves, to their students, or to parents—giving two students an A on work that differed in difficulty level, even when they were appropriate to the readiness levels of different students. Or, worse still, giving a gifted student a B on a very difficult assignment while giving a struggling student an A on a less challenging assignment.

Thus, many teachers continued to view the purposes of assessment and grading as measuring one student's performance against another's on identical tests. While many were able to embrace the theory of using assessment as a method of measuring individual achievement, most were unable to embrace it in practice. In teachers' eyes, grading students on different assignments violated their assumptions about what was "fair."

Beliefs about the goals of education. Beliefs about the goals of education also affected teachers' responses to differentiated instruction and assessment. During the time of the study, state standards and state testing were either entrenched or recent realities for all participating teachers. Pressure to ensure that students performed well on state tests caused many teachers to focus their instruction and assessment narrowly on the facts and skills that would be assessed. Regardless of content area, the majority of teachers reported that state standards were extremely important in determining the content for instruction, a sentiment echoed in the student survey data. By necessity, for many teachers the end goal of schooling was to get as many students as possible to achieve state-set benchmarks, rather than to develop enduring understandings in students through in-depth investigations of the discipline. As a result, teachers often felt forced to focus their attention on students they thought might pass the tests, rather than on students who would definitely pass (no need to worry about them) or on students who they believed had no chance of passing (a lost cause). The result of this narrow focus on students in the middle was that the practice of delivering a one-size-fits-all curriculum of "coverage" was reinforced by the state tests. Although many teachers indicated discomfort with this type of teaching, it was the norm in most of the classrooms that we visited.

A few participating teachers were able to articulate the need to balance preparing students for state tests with more authentic learning goals. Importantly, these individuals were teachers who were assigned to content areas and/or grade levels that were not part of the state testing system. These teachers were more likely than those who were directly affected by state tests to articulate ways in which differentiation and state mandates could work together and support each other, and could imagine how differentiation could lead to improved test scores for many students. These teachers understood the importance of scores on state tests, but did not feel panicky about them, perhaps due to the fact that they were not held directly accountable for students' test scores. They acknowledged that the state mandates were a reality in the classroom, but felt tests did not need to inform every

aspect of the classroom. As a result, they felt free to consider implementing differentiation practices.

Impact of Teachers' Content Knowledge and Pedagogical and Classroom Management Skills

For many teachers, failing to implement or inappropriately implementing differentiation of instruction and assessment was not so much a conscious choice as a default caused by limitations in content knowledge, pedagogy, and/or classroom management skills. Successful implementation of differentiation requires that teachers have a deep understanding of their content knowledge, a rich repertoire of pedagogical approaches, and effective classroom management routines.

For many teachers, depth of content knowledge presented the biggest challenge to appropriate use of differentiation. Many teachers were teaching outside of their content areas, had recently switched grade levels, or simply had a limited understanding of the content area for which they were certified. Differentiating for different readiness levels, interests, and learning profiles necessitates that a teacher know his or her subject matter deeply and intimately. A teacher must be familiar with a variety of materials and resources that explore similar concepts at different levels of complexity, must understand the key concepts and principles of a field, and must know how the content is organized well enough to be able to continually push individual students along from where they are, tap into student interests, and be able to present varied modes of learning. Attempting to differentiate instruction and assessment with limited knowledge of a content area results in shallow and ill-focused lessons and assessments.

Similarly, without classroom management skills, the high mobility of a differentiated classroom can prove intimidating to a teacher. Effective differentiation requires teachers to be capable facilitators of small and large group work, knowledgeable about methods of encouraging greater levels of student independence, and effective at managing several different tasks at once. For teachers who did not possess effective classroom management skills, initial attempts at differentiation were often highly unsuccessful, with students spending most of their time off-task and confused.

Teachers' attempts at differentiating instruction and assessment generally began with providing students with task and assessment options based on student interests or learning preferences. This may be a result of the fact that differentiating according to student interests and learning preferences was less intimidating to teachers as they took their first steps with differentiation. Fewer teachers ever attempted differentiation according to readiness levels, and many overtly expressed hesitance to do so. Differentiating according to readiness clashes with many classroom realities in a way that differentiating for interest and learning profile do not. First, differentiating by readiness level requires teachers to have a deep understanding of the organization of their disciplines, which many teachers do not possess. Second, presenting some students with tasks that, from a normative perspective, appear easier than those presented to others challenges teachers' perceptions of fairness in a way that simply presenting choices to

students does not. Finally, making curricular decisions about individual students according to their readiness levels opens up the possibility for classroom conversations about academic differences that teachers traditionally shy away from for fear of adversely affecting students' self-esteem. The existence of academic diversity in the classroom, while a reality obvious to both teachers and students, is often a taboo topic for conversation. Without such conversations about individual differences and the uniqueness of each child's strengths and needs, a differentiated classroom cannot function successfully.

Impact of State Mandates on Teachers' Use of Differentiation

State One

One external factor that had a universally negative effect on State One teachers' abilities to differentiate instruction and assessment, regardless of the strength of teachers' internal factors, was the introduction of a high-stakes testing initiative midway through the study. Even teachers who had easily cleared other hurdles and were progressing steadily with differentiation found themselves waylaid by the new state testing program. These teachers felt that all complex aspects of differentiation, such as concept-based instruction, tiered assignments, and long-term, differentiated projects would have to end until they figured out how to handle covering all of the standards, following a prescribed curriculum, and preparing students to pass the state tests, which followed a traditional, multiple-choice format. Many teachers noted that they hoped and planned to return to differentiating instruction and assessment once the initial shock of the state program wore off, but, in the meantime, all but surface attempts at differentiation stopped. Teachers in both the instruction and the assessment sites in State One responded similarly to the introduction of the state testing program.

Most teachers in State One—those with strong internal factors and those without—could not reconcile differentiation of instruction with standards-based instruction or differentiated assessment with high-stakes testing. A few teachers, both in the instruction and assessment sites, began to consider ways in which they could attend to both differentiation and the state mandates simultaneously, but their attempts at reconciling the two initiatives did not progress beyond the reflection stage into their practices. Their responses suggest that teachers may need extra support geared toward encouraging reflection and planning while facing two seemingly conflicting initiatives.

More extended time in the schools may have allowed coaches to work with teachers through their anxieties and questions about the state program, providing information about how teachers learn to reconcile the two seemingly conflicting initiatives and modeling ways in which differentiation can be used effectively to help students succeed in test-focused environments. But, it was clear from our experiences that teachers' initial reaction to taking on conflicting initiatives is predictably to abandon the one that exerts the least pressure and appears to have the fewest consequences.

State Two

State Two's state testing program was well-entrenched prior to the beginning of the study. State Two's state testing program was high-stakes and traditional, using predominately multiple-choice format tests to measure student learning. The state tests had obvious effects on teachers' classroom instruction; classroom observations revealed a certain standardization of teachers' practices across classrooms. Most classroom observations recorded teachers drilling students on test-like items and referring continually to what would be found on the tests. Additionally, the state testing program affected teachers' instructional and assessment decision-making processes: the content of the state tests, rather than the individual needs of the students, was at the center of teachers' decisions about curriculum and assessment. This test-centered mindset made it difficult for teachers to conceive of how to address student differences while simultaneously trying to get them all to reach the same benchmarks. To teachers, these two goals remained oppositional.

There were some differences in response between State Two teachers in the differentiated instruction site and those in the differentiated assessment site. Greater numbers of teachers in the instruction site made at least surface attempts at differentiating instruction and more seemed able to conceive of differentiated instructional practices working alongside test preparation activities. While no teachers in the instruction site were using "deep structure differentiation," many were enthusiastic about the smaller changes that they had made to their practices.

Few teachers in the differentiated assessment site in State Two attempted even surface changes to their assessment practices and were, overall, more negative about and resistant to participation in the study than teachers in the instruction site. Only two teachers in the assessment site made any attempts at differentiating assessment. The differences between the two sites in State Two could be attributed to several factors: the instruction site possessed a more stable, positive school climate and a coach who was an extremely active, present, and encouraging supporter of participating teachers. Additionally, differentiation of assessment conflicted more directly and immediately with the entrenched state testing mindset in pronounced and complicating ways than did differentiation of instruction. Teachers in the assessment site felt that they could not adequately prepare students for the all-important multiple-choice state tests and assess students through authentic assessments. The authentic assessments "looked different" from the fill-in-the-bubble format of the state test in that the assessments posed real-life problems where students were involved in problem-solving, decision-making, and using resources to guide decision-making.

While teachers in State Two were acclimated to teaching to the state tests, pressure to prepare students to pass these tests still produced anxiety in many teachers, often complicating their attempts at differentiating instruction or assessment. As in State One, teachers in State Two could not see any alignment between the goals of differentiation and the goals of the state tests despite articulated state standards for each authentic assessment. While teachers in State Two did not react with the panic that

teachers in State One did when faced with reconciling two philosophically opposing approaches to teaching and learning, they struggled in their attempts to mesh the two approaches together. Rather than simplifying teachers' attempts to differentiate instruction and assessment, the deeply entrenched nature of the state testing mindset in State Two made changing teachers' practices extremely difficult. The long shadow of state tests hung over all classrooms, in many cases obscuring teachers' ability to recognize the importance of responding to individual students' needs.

State Three

State Three's state testing program utilized performance assessments and had been in place for several years prior to the start of the study. Teachers in State Three did not present the same preoccupation with preparing students for the state tests as did teachers in the other two states. Teachers in this state expressed less anxiety about the state tests. Two factors inherent in the nature of the state testing program in State Three may have contributed to a difference. First, teachers in State Three participated in the scoring process and individual students' scores were not reported. Teachers generally believed that the performance assessment format of the state tests encouraged authentic student learning, a goal aligned with the goals of differentiated instruction. As a result, the state tests did not interfere with teachers' thinking about differentiating instruction. Second, it is important to note that due to early withdrawal from the study, there was no assessment site in State Three.

While state testing mandates did not interfere with teachers' attempts at differentiating instruction in State Three, teachers cited more local pressure-inducing factors as complicating their efforts to differentiate. Teaching interdisciplinary classes, learning and keeping up with a secondary content area, multiple teacher responsibilities, and frequent, high-stakes administrator observations of teachers' classrooms put immense pressure on teachers. Many teachers articulated a need to attend to these pressure-inducing factors before they could focus attention on differentiating instruction.

Our experiences in States One, Two, and Three indicate that when under intense, external pressure, teachers are poorly equipped to respond to invitations to voluntarily change their practices. Under such circumstances, teachers' change efforts are often erratic. Teachers "fit in" new practices when they have time or feel secure, but are not able to do so in any systematic or consistent way. In some instances, intense external pressure makes teachers feel incapable of making any changes that are not immediately and obviously tied to attaining the goals of the pressure-creating mandate.

Impact on Students

The differentiation sites showed greater gains in student achievement and more positive student attitudes toward school than did the other schools, but there is no consistent pattern between teachers who attempted differentiation and the content areas or grade levels where statistical differences were found. In other words, there is no consistency in the few teachers who did make earnest attempts to implement deep

structure differentiation and the patterns of student achievement, student attitudes, or student self-concepts. Because the numbers of teachers and students in these groups are small, significance may not be detectable. Or, it may be that the tests themselves are not sensitive. Or it may be that the degree to which differentiation is implemented does not have significant impact. One can speculate that even moderate differentiation yields change. In the classrooms that were observed where teachers were making earnest attempts to address academic diversity, students were observed to be more engaged, more involved in learning experiences, and more active participants in the learning process.

Considerations to Note When Interpreting Findings

The short time span of the project, the lack of constant presence from research personnel (as a result of changing personnel in coaches and the reality of being an outsider to their school), and the potential unreliability of covariates are design issues that need to be considered when interpreting the study's findings.

Study Design

Time Span

The funding cycle of this project was shorter in duration than the literature on teacher change indicates is necessary for systematic and long-term changes to occur in teaching practices. As a result, full understanding of the complex interactions among teachers, students, and the innovations is limited.

Statistical Issues

Analysis of covariance (ANCOVA) techniques in this study were employed in an attempt to adjust pre-treatment group means because of the inability to randomly assign students and schools to treatments. While adjustment for prior mean differences is appropriate in non-experimental research, it is highly likely that other differences among students and/or schools existed that were not controlled. As a result, generalizations about student achievement, student attitudes, and student self-concepts are limited and certainly cannot support any causal inference of treatment effects. Such generalizations would need to be based upon random assignment to treatment groups.

The issue of possible unreliability in the covariate warrants attention. Although the ITBS subtests are psychometrically sound, the extreme grade equivalent scores on the pre-project ITBS subtests of the differentiation schools raises the question of the reliability of the instruments for such high achieving schools. Based on grade equivalent scores, the ITBS may have been too easy for the schools participating in the differentiation treatment, restriction of the score range, and, consequently, of true score variance likely lowered the reliability of the ITBS as a covariate, thus affecting the covariates' ability to adequately adjust for pre-project differences.

Cautions Regarding Generalizing the Qualitative Findings

Because differentiation is such a complex endeavor coupled with the realization that the research study lacked school district accountability, we saw only limited attempts to address students' academic diversity. Consequently, the findings discussed here are based upon a small group of teachers who made inconsistent attempts at differentiating their classroom instruction or assessment. Therefore, it is important to consider the specific contexts that may have contributed to these teachers' decisions to make these attempts and limit generalization of these findings to broader contexts.

Recommendations

1. Changing teachers' beliefs and practices requires an informed, supportive educational community. There is evidence that the change process required to implement differentiation must include whole-school communities, not just teachers. While teachers are the ones who ultimately must make the changes to their practices, data indicate that they cannot do so without the support of an administrator who understands and believes in the initiative. A supportive administrator provides teachers with the planning time they need to prepare differentiated lessons or assessments, encourages collaboration on differentiation between teachers, has the thorough knowledge of differentiation necessary to conduct classroom observations and provide constructive feedback to teachers, and recognizes the messiness and risk involved in the change process.

Knowledge and support of the initiative must extend beyond school walls. Because the beliefs about teaching and learning underlying differentiation (including notions of fairness, student success, and challenge) frequently conflict with more traditional approaches to education, parents need to be educated early about the big-picture purposes of and processes involved in differentiation. Consensus building that changes traditional beliefs about learning, teaching, and grading of all stakeholders must be part of the educational process.

2. Teachers in the midst of changing beliefs and practices require consistent coaching and honest, informed feedback about their efforts. This study's findings indicate that teachers in the process of learning to differentiate require support from knowledgeable individuals who are willing and able to conduct observations and provide constructive feedback. Such coaches need to be located on-site and occupy visible positions of earned respect—not simply authority—in the school community. Coaches must be able to achieve the delicate balance of supporting and encouraging teachers while simultaneously challenging them to move to the next level. Coaches who provide only encouragement and kudos risk limiting the growth of the teachers with whom they work. On the other hand, continual critique without positive reinforcement can discourage and frustrate teachers. Identifying positive growth while articulating necessary next steps for teachers will allow them to both feel rewarded for the change they have made and prepared for the change they have yet to make.

3. Changing teachers' beliefs and practices requires substantial time. The change literature suggest that because of the complex nature of the task, it takes at least 5 to 7 years of consistent efforts for the changes to become fully woven into the fabric of the school (Fullan, 1993). This study's data indicate that the time required for teachers to employ deep structure differentiation may be even longer because of the need to examine, and possibly re-examine and modify, beliefs about a philosophy of teaching, attain deep content knowledge, master a broad range of pedagogical skills, and develop the expert classroom management skills needed in a differentiated classroom. While most teachers can employ surface differentiation rather readily in the classroom, deep structure differentiation involves a great deal of time and effort. Most importantly, learning to differentiate requires teachers to see the big picture behind differentiation. Teachers need to realize and understand that differentiation is not a formula for success that can be mechanically applied, but that it is instead a commitment to improvement in teaching practice by developing a deeper understanding of content area, adopting new and different goals for themselves and for students, implementing new strategies, and making connections to students' lives. It requires time, commitment, trial and error, and the support of the whole school community.

4. Implementing differentiation benefits from a healthy school environment. Differentiation of instruction and assessment require school wide change and support; such change and support is only possible in healthy school environments. This does not mean that a school has to have an abundance of resources and a highly motivated and highly achieving student population, but rather that the relationships between stakeholders in the school (e.g., administrators, teachers, media specialists, counselors, students, parents) are trusting, supportive, and encouraging, and that stakeholders are motivated toward the same basic goals.

5. Changing teachers' beliefs and practices requires individual and peer reflection. Undergoing change can be isolating and intimidating for a teacher. Too often, teachers are expected to undertake major changes to their teaching practice with little to no peer support or opportunities to plan or reflect built in to the implementation plan. Time to collaborate, reflect, strategize, and plan with other like-minded teachers involved in the same process is a necessity for providing the support that teachers need while undergoing change. Grade-level, team, or departmental differentiation support groups should be instituted as part of the implementation plan, and time should be set aside for such meaningful interactions and planning. Providing teachers with this time is particularly important, as data indicate that teachers feel that their ability to make the changes to their curriculum and instruction involved in differentiation is hindered by lack of planning time.

6. The most significant changes to teachers' beliefs and practices occur when teachers are intrinsically motivated to make these changes. Change occurs most authentically when an individual is driven by his or her own desire to undertake change. This study's data indicate that teachers who are intrinsically motivated to undertake change are more willing to participate in staff development, more likely to implement the targeted changes in their classrooms, and more likely to stick with the initiative over

time. Conversely, teachers who are only extrinsically motivated to partake in a change effort (either to attain positive rewards from superiors or to avoid negative consequences for nonparticipation) are unlikely to make more than superficial changes to their practices or to stick to the initiative after pressure to do so has been removed. External motivators and rewards can serve as additional support and reinforcement for internally motivated efforts, but should not be relied upon as the sole method for involving teachers in long-range change efforts.

Teachers need to see how differentiation of instruction and assessment can benefit their students and improve their own teaching practices. Early staff development efforts should focus on how differentiation can provide solutions to common issues teachers struggle with in the classroom.

7. Staff development and coaching efforts should focus on ways of encouraging teachers to utilize pre-existing organizational structures and resources to begin the process of creating a responsive classroom environment. At the outset, differentiation can appear overwhelming to school personnel. However, the process can seem less intimidating for educators when they are aware of the existing material and human resources (e.g., already-collected student assessment data such as locally developed diagnostic tools and state tests; the specialized skills and knowledge of other staff members such as special education teachers, media specialists, and gifted resource teachers; the specialized skills and knowledge of community members) and organizational structures (e.g., grade level interdisciplinary teams) that they have at their disposal. Staff development efforts should include a discussion of what pre-existing resources and structures exist within the school and community and how they can be utilized to facilitate the process of differentiating instruction and assessment.

8. Teachers in the process of changing their beliefs and practices need differentiated coaching. Coaching for teachers must be differentiated, as teachers, like students, come to the learning process with varied knowledge, strengths, and needs. To employ deep structure differentiation, teachers need to have deep content knowledge, pedagogical skills, and a good handle on classroom management. However, some teachers come to coaching with deep content knowledge but lacking in pedagogical skills. Others have excellent pedagogical skills but only limited content knowledge. Still others possess both. In addition to differentiating coaching in response to the skills and knowledge that teachers possess, coaches need to consider the deep structure beliefs with which teachers enter the change process. Coaching for teachers with pre-existing student-centered, constructivist beliefs about teaching and learning will look different from coaching for teachers with behaviorist, teacher-centered approaches to the classroom. Differentiating coaching according to a teacher's knowledge, skills, and beliefs allows a coach to introduce the teacher to new ideas at a level of challenge comfortable for him or her, and to move the teacher along the path to full implementation at a pace appropriate to that teacher.

9. When addressing academic diversity, teachers must recognize students' varied readiness needs. While differentiation according to interest and learning style is

important, it may obscure for teachers the need to differentiate by readiness. This may in part stem from an inherent misunderstanding that many teachers new to differentiation develop: that differentiation is simply about providing multiple options for students. Teachers need to be shown that differentiation is a thoughtful response to student need and not a series of tricks to use upon whim. At times it is appropriate to introduce new material using "hooks," or learning experiences geared toward different students' interests. At others, as when pre-assessment data indicate a wide range of student understanding of a concept to be taught, it is appropriate to provide extra scaffolding for some students and additional challenge for others.

While differentiation according to readiness is often intimidating to teachers and often conflicts with their beliefs about fairness and student success, it is necessary to introduce the concept to teachers early on in the implementation process and encourage them to try, with ever increasing complexity, to address student differences in readiness through their instruction and assessment. Otherwise we risk communicating a misunderstanding to teachers: that differentiation is indeed just a variety of "buckets" they can dig into for a new instructional track through which to deliver curriculum. To avoid this type of confusion, staff development efforts should never focus solely on addressing student interest or learning profile, but instead should consistently reinforce, explicate, and illustrate how to attend to student readiness in conjunction with student interest and/or learning profile.

10. Changing beliefs and practices requires teachers to confront their prior assumptions about teaching and learning. Differentiation according to readiness, as noted above, clashes in dramatic ways with traditional beliefs about fairness. For many teachers (and administrators, students, and parents), differentiation according to readiness appears "unfair." That is, grading students on assignments that are not equally challenging appears to penalize advanced students and reward struggling students for "less work." From the viewpoint of differentiation, fairness is not "the same." Fairness is achieved when we match a learning experience's challenge level with the needs of individual learners. These two conceptions of fairness are vastly different: the traditional vision of fairness rests upon a system in which students are compared to one another, while the vision of fairness in differentiation rests upon meeting individual student needs and meeting state goals and standards of performance.

To promote differentiation according to readiness, we must give teachers a repertoire for discussion of fairness issues with other teachers, with students, and with parents. Teachers need to be able to articulate, to themselves and to others, the rationale that lies behind the differentiation practices that they are employing in their classrooms. This rationale is not internalized simply through a few hours of staff development or through familiarity with differentiation strategies. The rationale behind differentiation and the beliefs that accompany it must be addressed and revisited regularly with teachers.

11. Teachers need support as they attempt to address diverse student needs in a culture of accountability. Standards and high-stakes testing are a reality in nearly every classroom in the country. Data indicate that the pressures that accompany

preparing students to meet standards and reach state-set benchmarks often overburden teachers to the point where considering differentiation is not an option. Additionally, the philosophy of teaching and learning underlying standards and high-stakes tests seems to conflict with the philosophy underlying differentiation, causing teachers to feel torn between the desire to meet the needs of diverse students and the need to ensure that all students reach the same standards and benchmarks.

Differentiation, however, can work well within the structure of the standards and preparing students for state assessments. The standards provide the framework for the knowledge and skills (and, infrequently, understandings) all students are responsible for mastering. Differentiation can provide different pathways to allow students not only to reach the standards but to extend their knowledge, skills, and understanding beyond the standards.

Because the symbiosis between the standards and differentiation is not immediately apparent, extra support is needed from outside the classroom to reconcile the perceived conflicts between standards/high-stakes testing and differentiation. Coaches need to keep in mind, when working with teachers, the importance of tying all differentiated lessons and activities to the standards for which the teachers are responsible.

Significance

Examination of the feasibility of two different approaches intended to address academic diversity in diverse middle schools, differentiated instruction and differentiated authentic assessment, yielded some unanticipated but noteworthy findings around the themes of teachers' beliefs, attitudes, and instructional practices, the importance of leadership in schools, and the general complexity of the change process. The findings of this study add to or support the body of literature in at least four areas: a) factors that support and inhibit teacher change, b) characteristics of effective professional development and coaching for teachers, c) organizational theory and leadership, and d) the influence of high-stakes testing and accountability on teachers' curriculum, instruction, and assessment practices.

References

Alexander, W. (Ed.). (1969). *The emergent middle school*. New York: Holt.

Alexander, W., & George, P. (1981). *The exemplary middle school*. New York: Holt.

Allan, S. (1991). Ability grouping research reviews. What do they really say to the practitioner? *Educational Leadership, 48*(6), 60-65.

Amabile, T. (1996). *Creativity in context.* Boulder, CO: Westview Press.

Archambault, F., Westberg, K., Brown, S., Hallmark, B., Emmons, C., & Zhang, W. (1993). *Regular classroom practices with gifted students: Results of a national survey of classroom teachers* (Research Monograph 93102). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Archbald, D. A. (1991). *Authentic assessment: What it means and how it can help schools* (Report No. TM 020 999). Madison, WI: National Center for Effective Schools Research and Development. (ERIC Document Reproduction Service No. ED366624)

Arlin, M., & Hills, D. (1976). *Arlin-Hills Attitude Surveys.* Chesterfield, MO: Psychologists and Educators.

Arnold, J. (1991). Towards a middle level curriculum rich in meaning. *Middle School Journal, 23*(2), 8-12.

Arnold, J. (1993). A curriculum to empower young adolescents. *Midpoints, 4*(1), 1-11.

Bandura, A. (1977). *Social learning theory.* Englewood Cliffs, NJ: Prentice Hall.

Bascia, N., & Hargreaves, A. (Eds.). (2000). *The sharp edge of educational change: Teaching, leading and the realities of reform*. New York: Falmer.

Beane, J. A. (1990). *A middle school curriculum: From rhetoric to reality* (2nd ed.). Columbus, OH: National Middle School Association.

Bearne, E. (Ed.). (1996). *Differentiation and diversity in the primary school*. London: Routledge.

Belenky, M., Clinchy, B., Goldberger, N., & Tarule, J. (1986). *Women's ways of knowing: The development of self, voice, and mind.* New York: Basic Books.

Berk, L. (1991). *Child development* (2nd ed.). Needham Heights, MA: Allyn and Bacon.

Berliner, D. (1988). *The development of expertise in pedagogy.* Washington, DC: American Association of Colleges for Teacher Education. (ERIC Document Reproduction Service No. ED298122)

Bodrova, E., & Leong, D. J. (1996). *Tools of the mind: The Vygotskian approach to early childhood education*. Englewood Cliffs, NJ: Merrill.

Bondi, J. (1978). *Developing middle schools*. Wheeling, IL: Whitehall.

Borland, J. H. (1989). *Planning and implementing programs for the gifted.* New York: Teachers College Press.

Boudah, D., Deshler, D., Schumaker, J., Lenz, K., & Cook, B. (1997). Student-centered or content-centered? A case study of a middle school teacher's lesson planning and instruction in inclusive classrooms. *Teacher Education and Special Education, 20,* 189-203.

Brandt, R. (1998). *Powerful learning*. Alexandria, VA: Association for Supervision and Curriculum Development.

Brown, D. F. (1992, April). *Altering curricula through state testing: Perceptions of teachers and principals.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

Burstein, N. D., & Cabello, B. (1989). Preparing teachers to work with culturally diverse students: A teacher education model. *Journal of Teacher Education, 40*(5), 59-16.

Carnegie Council on Adolescent Development. (1989). *Turning points: Preparing American youth for the 21st century.* New York: Carnegie Corporation.

Cheek, D. W. (1993). Plain talk about alternative assessment. *Middle School Journal, 25*(2), 6-10.

Clark, D. C., & Clark, S. N. (2000). Developmentally responsive curriculum and standards-based reform: Implications for middle level principals. *NASSP Bulletin, 84*(615), 1-13.

Coffman, W. E. (1983). *Testing in the schools: A historical perspective.* Paper presented at the annual invitational conference of the Center for the Study of Evaluation, University of California, Los Angeles.

Collins, M., & Amabile, T. (1999). Motivation and creativity. In R. Sternberg (Ed.), *Handbook of creativity* (pp. 297-312). Cambridge, UK: Cambridge University Press.

Conover, L. A. (2001). *Effects of the school environment on teachers' responses to student differences and to change initiatives*. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Cook, L., & Friend, M. (1995). Co-teaching: Guidelines for effective practices. *Focus on Exceptional Children, 28*(3), 1-16.

Correa, V., & Tulbert, B. (1991). Teaching culturally diverse students. *Preventing School Failure, 35*(3), 20-35.

Council of Chief State School Officers. (2000). *State student assessment programs annual survey. Spring 2001.* Washington, DC: Author.

Cross, L. H., & Frary, R. B. (1999). Hodgepodge grading: Endorsed by students and teachers alike. *Applied Measurement in Education, 12*, 53-72.

Csikszentmihalyi, M. (1997). Flow and creativity. *Namta Journal, 22*(2), 60-97.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993). *Talented teenagers: The roots of success and failure.* New York: Basic Books.

Cuban, L. (1993). The lure of curricular reform and its pitiful history. *Phi Delta Kappan, 75,* 181-185.

Cunningham, G. K. (1991). Educational testing and educational reform: Some misconceptions. *Contemporary Education, 62,* 238-242.

Currier, L. (1986). A declaration of independence: A creed for middle school educators. *Middle School Journal, 17*(2), 4-6.

Dana, T. M., & Tippins, D. J. (1993). Considering alternative assessment for middle level learners. *Middle School Journal, 25*(2), 3-5.

Darling-Hammond, L. (1994). Setting standards for students: The case for authentic assessment. *The Educational Forum, 59*, 14-21.

Darling-Hammond, L. (1997). *The right to learn: A blueprint for creating schools that work*. San Francisco: Jossey-Bass.

Day, J., & Cordon, L. A. (1993). Static and dynamic measures of ability: An experimental comparison. *Journal of Educational Psychology, 85,* 75-82.

DeBoer, A. (1995). *Working together: The art of consulting and communicating.* Longmont, CO: Sopris West. (ERIC Document Reproduction Service No. ED388919)

Deno, S. L. (1994). *Effects of support conditions on teachers' instructional adaptation and student learning.* Paper presented at the second annual Pacific Coast Research Conference, La Jolla, CA.

Donahoe, T. (1993). Finding the way: Structure, time, and culture in school improvement. *Phi Delta Kappan, 75,* 298-305.

Duke, D. L. (1993). Removing barriers to professional growth. *Phi Delta Kappan, 74,* 702-04, 710-712.

Dunn, R., Gemake, J., Jalal, F., Quinn, P., Spiridakis, J., & Zenhausen, R. (1990). Cross-cultural differences in learning styles of elementary students from four ethnic backgrounds. *Journal of Multicultural Counseling and Development, 18*, 68-93.

Dunn, R., & Milgram, R. (1993). Learning styles of gifted students in diverse cultures. In R. Milgram, R. Dunn, & G. Price (Eds.), *Teaching and counseling gifted and talented adolescents* (pp. 3-23). Westport, CT: Praeger.

Eccles, J. S., & Wigfield, A. (1997). *Young adolescent development.* Columbus, OH: National Middle School Association. (ERIC Document Reproduction Service No. ED427847)

Egan, K., & Gardner, H. (1992). An exchange: The unschooled mind: How children think and how schools should teach. *Teachers College Record, 94,* 397-407.

Eichorn, D. (1966). *The middle school*. New York: The Center for Applied Research in Education.

Elmore, R., Peterson, P., & McCarthey, S. (1996). *Restructuring in the classroom: Teaching, learning and school organization.* San Francisco: Jossey-Bass.

Erickson, F. (1986). Qualitative methods of research on teaching. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 119-161). New York: MacMillan.

Evans, R. (1996). *The human side of school change: Reform, resistance, and the real-life problems of innovation*. San Francisco: Jossey-Bass.

Ewing, N. J., & Yong, F. L. (1992). A comparative study of the learning style preferences among gifted African American, Mexican-American, and American-born Chinese middle grade students. *Roeper Review, 14*, 120-123.

Feldhusen, J., & Moon, S. (1992). Grouping gifted students: Issues and concerns. *Gifted Child Quarterly, 36,* 63-67.

Fletcher, T., Bos, C., & Johnson, L. (1999). Accommodating English language learners with language and learning disabilities in bilingual education classes. *Learning Disabilities Research & Practice, 14,* 80-91.

Ford, D. Y. (1994). *The recruitment and retention of African American students in gifted education programs: Implications and recommendations* (RBDM 9406). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Frary, R. B., Cross, L. H., & Weber, L. J. (1993). *Testing and grading practices and opinions in the nineties: 1890s or 1990s?* Blacksburg, VA: Office of Measurement and Research Services, Virginia Polytechnic Institute and State University. (ERIC Document Reproduction Service No. ED351357)

Frasier, M. M., Hunsaker, S. L., Lee, J., Finley, V. S., Frank, E., Garcia, J. H., & Martin, D. (1995). *Educators' perceptions of barriers to the identification of gifted children from economically disadvantaged and limited English proficient backgrounds* (Research Monograph No. 95216). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Frederiksen, N. (1994). *The influence of minimum competency tests on teaching and learning.* Princeton, NJ: Educational Testing Service, Policy Information Center. (ERIC Document Reproduction Service No. ED369820)

Fuchs, D., Fuchs, L. S., & Bahr, M. W. (1990). Mainstream assistance teams: A scientific basis for the art of consultation. *Exceptional Children, 57,* 128-139.

Fuchs, L. S., & Fuchs, D. (1993). Effects of systematic observation and feedback on teachers' implementation of curriculum-based measurement. *Teacher Education & Special Education, 16,* 178-187.

Fuchs, L. S., & Fuchs, D. (1998). General educators' instructional adaptation for students with learning disabilities. *Learning Disability Quarterly, 21,* 23-33.

Fulk, B., & Montgomery-Grymes, D. (1994). Strategies to improve student motivation. *Intervention in School and Clinic, 30,* 28-33.

Fullan, M. (1991). *The new meaning of educational change* (2nd ed.). New York: Teachers College Press.

Fullan, M. (1992). *Successful school improvement: The implementation perspective and beyond. Modern educational thought*. Bristol, PA: Open University Press.

Fullan, M. (1993). *Change forces: Probing the depth of educational reform*. London: Falmer Press.

Fullan, M. (1995). The school as a learning organization: Distant dreams. *Theory into Practice, 34*, 230-235.

Gallagher, J., Coleman, M., & Nelson, S. (1995). Perceptions of educational reform by educators representing middle schools, cooperative learning, and gifted education. *Gifted Child Quarterly, 39,* 66-76.

Gardner, H. (1991). *The unschooled mind: How children think and how schools should teach*. New York: Basic Books.

Gardner, H. (1993). *Multiple intelligences: The theory in practice*. New York: Basic Books.

Gentry, M., & Neu, T. W. (1998). Project High Hopes Summer Institute: Curriculum for developing talent in students with special needs. *Roeper Review, 20,* 291-295.

George, P. S., & Alexander, W. M. (1993). *The exemplary middle school* (2nd ed.). Fort Worth, TX: Harcourt Brace Jovanovich.

George, P. S., & Grebin, W. (1995). Talent development and grouping in the middle grades: Challenging the brightest without sacrificing the rest. *Middle School Journal, 26*(4), 12-17.

George, P. S., Lawrence, G., & Bushnell, D. (1998). *Handbook for middle school teaching* (2nd ed.). New York: Addison-Wesley.

Gersick, C. J. G. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *The Academy of Management Review, 16*, 10-36.

Gersten, R., & Marks, S. U. (1998). Engagement and disengagement between special and general educators: An application of Miles and Huberman's cross-case analysis. *Learning Disability Quarterly, 21*(1), 34-56.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine Publishing.

Gold, B. A. (1999). Punctuated legitimacy: A theory of teacher change. *Teachers College Record, 101,* 192-219.

Goldsmith, L. T., & Kantrov, I. (2000). Evaluating middle grades curricula for high standards of learning and performance. *NASSP Bulletin, 84*(615), 31-39.

Good, T. L. (1985). *Classroom research: What we know and what we need to know* (Report No. XPT87575). Austin, TX: Research and Development Center for Teacher Education, Texas University. (ERIC Document Reproduction Service No. ED251436)

Gordon, E. W., & Bonilla-Bowman, C. (1996). Can performance-based assessment contribute to the achievement of educational equity? In J. B. Baron & D. P. Wolf (Eds.), *Performance-based student assessment: Challenges and possibilities* (pp. 32-51). Chicago: National Society for the Study of Education.

Gottfried, A. E., & Gottfried, A. W. (1996). A longitudinal study of academic intrinsic motivation in intellectually gifted children: Childhood through early adolescence. *Gifted Child Quarterly, 40,* 179-183.

Graves, D. H. (1983). *Writing: Teachers and children at work.* Exeter, NH: Heinemann Educational Books.

Haladyna, T. M. (1991). Raising standardized achievement test scores and the origins of test score pollution. *Educational Researcher, 20*(5), 2-7.

Hall, G. E. (1985, April). *A stages of concern approach to teacher preparation.* Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Hallahan, D., Kauffman, J., & Lloyd, J. (1999). *Introduction to learning disabilities* (2nd ed.). Boston: Allyn and Bacon.

Hansen, J. B. (1993). Is educational reform through mandated accountability an oxymoron? *Measurement and Evaluation in Counseling and Development, 26,* 11-21.

Harter, S. (1978). Pleasure derived from challenge and the effects of receiving grades on children's difficulty level choices. *Child Development, 49,* 788-799.

Henderson, P., & Karr-Kidwell, P. J. (1998). *Authentic assessment: An extensive literary review and recommendations for administrators* (Report No. TM 028 235). Dallas, Fort Worth, TX: Fort Worth ISD & Texas Woman's University. (ERIC Document Reproduction Service No. ED418140)

Herman, J. L., & Dorr-Bremme, D. W. (1982, March). *Assessing students: Teachers' routine practices and reasoning.* Paper presented at the annual meeting of the American Educational Research Association, New York.

Herman, J. L., & Golan, S. (1990). *Effects of standardized testing on teachers and learning—another look* (Report No. CSE-TR-334). Washington, DC: Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED341738)

Herman, J. L., & Golan, S. (1993). The effects of standardized testing on teaching and schools. *Educational Measurement: Issues and Practice, 12,* 20-25, 41, 42.

Hogan, K., & Pressley, M. (1997). Scaffolding scientific competencies within classroom communities of inquiry. In K. Hogan & M. Pressley (Eds.), *Scaffolding student learning: Instructional approaches and issues* (pp. 74-107). Cambridge, MA: Brookling Books.

Hopkins, D. (1990). Integrating staff development and school improvement: A study of teacher personality and school climate. In B. Joyce (Ed.), *Changing school culture through staff development* (pp. 41-70). Alexandria, VA: Association for Supervision and Curriculum Development.

Iowa Tests of Basic Skills. (1995). Chicago: Riverside.

Jackson, A. W., & Davis, G. A. (2000). *Turning Points 2000: Educating adolescents in the 21st century.* New York: Teachers College Press.

Jenkins, J., Jewell, M., Leceister, N., Jenkins, L., & Troutner, N. (1990, April). *Development of a school building model for educating handicapped and at risk students in general education classrooms.* Paper presented at the annual meeting of the American Educational Research Association, Boston, MA.

Jenkins, J., & Leicester, N. (1992). Specialized instruction within general education: A case study of one elementary school. *Exceptional Children, 58,* 555-563.

Joyce, B. R. (1990). The self-educating teacher: Empowering teachers through research. In B. Joyce (Ed.), *Changing school culture through staff development* (pp. 26-40). Alexandria, VA: Association for Supervision and Curriculum Development.

Joyce, B. R., & Showers, B. (1996, Winter). Staff development as a comprehensive service organization. *Journal of Staff Development*, 17, 2-6.

Kennedy, M. (1996). A teacher's manifesto: Designing learning which cures rather than causes academic risk: Part 2. *Journal of At-Risk Issues, 2*(2), 16-27.

Kulik, J., & Kulik, C. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly, 38,* 73-77.

LaFrance, E. B. (1997). The gifted/dyslexic child: Characterizing and addressing strengths and weaknesses. *Annals of Dyslexia, 47,* 163-182.

Lasley, T., & Matczynski, T. (1997). *Strategies for teaching in a diverse society: Instructional models*. Belmont, CA: Wadsworth.

Lazar-Morris, C., Polin, L., May, R., & Barry, L. (1980). *A review of the literature on test use.* Los Angeles: Center for the Study of Evaluation, University of California. (ERIC Document Reproduction Service No. ED204411)

Lincoln, Y. S., & Guba, E. G. (1990). *Naturalistic inquiry*. Thousand Oaks, CA: Sage Publications.

Lines, C. (1994). Authentic assessment at the middle level. *Middle School Journal, 25*(4), 39-41.

Lipsitz, J. (1984). *Successful schools for young adolescents.* New Brunswick, NJ: Transaction Books.

Lortie, D. C. (2002). *School-teacher: A sociological study* (2nd ed.). Chicago: University of Chicago Press.

Louis, K. S., & Miles, M. B. (1990). *Improving the urban high school: What works and why.* New York: Teachers College Press.

Lubinski, D., & Benbow, C. P. (1995). Optimal development of talent: Respond educationally to individual differences in personality. *Educational Forum, 59,* 381-392.

Lutz, F., & Maddirala, J. (1990). Stress, burnout in Texas teachers and reform mandated accountability. *Educational Research Quarterly, 14*(2), 10-21.

Margolin, L. (1994). *Goodness personified: The emergence of the gifted children*. New York: Aldine de Gruyter.

Marlowe, B. A., & Page, M. L. (1998). *Creating and sustaining the constructivist classroom.* Thousand Oaks, CA: Corwin Press.

Marsh, H. W. (1990). *Self-description questionnaire II: Manual.* Cambleton, NSW Australia: University of Western Sydney, Macarthur.

Matthews, J. (2000, December 26). Adopting tests, adapting lessons: Teachers say standardized exams force them to focus and be consistent. *The Washington Post*, p. B3.

McEwin, K. C. (1996). *America's middle schools: Practices and progress. A 25-year perspective.* Columbus, OH: National Middle School Association. (ERIC Document Reproduction Service No. ED396842)

Meaghan, D. E., & Casas, F. R. (1995). On the testing of standards and standardized achievement testing: Panacea, placebo, or Pandora's box? *Interchange, 26*(1), 33-58.

Minner, S. (1989). Initial referral recommendations of teachers toward gifted students with behavioral problems. *Roeper Review, 12,* 78-80.

Moon, T. R., Brighton, C. M., & Callahan, C. M. (2003). State standardized testing programs: Friend or foe of gifted education? *Roeper Review, 25*, 49-60.

Moon, T. R., Brighton, C. M., Hertberg, H. L., Callahan, C. M., Tomlinson, C. A., Esperat, A. M., & Miller, E. M. (2003). *School characteristics inventory: Investigation of a quantitative instrument for measuring the modifiability of school contexts for implementation of educational innovations* (RM03182). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Moon, T. R., Callahan, C. M., & Tomlinson, C. A. (2003). Effects of state testing programs on elementary schools with high concentrations of student poverty—Good news or bad news? *Current Issues in Education* [On-line], *6*(8). Available http://cie.ed.asu.edu/volume6/number8

Moon, T. R., Tomlinson, C. A., & Callahan, C. M. (1995). *Academic diversity in the middle school: Results of a national survey of middle school administrators and teachers* (Research Monograph 95124). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Muth, K. D., & Alvermann, D. E. (1999). *Teaching and learning in the middle grades* (2nd ed.). Boston: Allyn and Bacon.

National Alliance of Business. (1999). *Positive results for all students dispel fears of leaving some behind* (Report No. CE078101). Washington, DC: Author. (ERIC Document Reproduction Service No. ED427203)

National Commission on Excellence in Education. (1983). *A nation at risk: A report to the nation and the Secretary of Education* (Department of Education Report No. ED 1.2:N 21). Washington, DC: U.S. Government Printing Office.

National Middle School Association. (1995). *This we believe: Developmentally responsive middle schools.* Columbus, OH: Author.

Norton, S., Hartwell-Hunnicutt, K., & Norton, R. C. (1996). The learning disabled/gifted student. *Contemporary Education, 68*, 36-40.

Oakes, J. (1985). *Keeping track: How schools structure inequality.* New Haven, CT: Yale University Press.

Olson, L. (2001, April 18). Researchers identify the impact of NJ testing on teaching. *Education Week*. Retrieved January 4, 2002, from http://www.edweek.org

Pasch, M., & Harberts, J. C. (1992). Does coaching enhance instructional thought? *Journal of Staff Development, 13*(3), 40-44.

Pate, P. E., Homestead, E. R., & McGinnis, K. L. (1997). *Making integrated curriculum work: Teachers, students, and the quest for coherent curriculum*. New York: Teachers College Press.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage Publications.

Piers, J. C. (1984). *Fostering the school age child: Instructor's manual* (BBB23570). Ypsilanti, MI: Institute for the Study of Children and Families, Eastern Michigan University. (ERIC Document Reproduction Service No. ED259830)

Popham, W. (1994). The instructional consequences of criterion-referenced clarity. *Educational Measurement: Issues and Practices, 13*(4), 15-18, 30.

Quattrone, D. (1990). Carnegie's middle school ideals: Phases of program development. *Journal of Curriculum and Supervision, 6,* 52-61.

Queen, J. (1999). *Curriculum practice in the elementary and middle school.* Upper Saddle River, NJ: Prentice-Hall.

Reed, L. (1993). Achieving the aims and purposes of schooling through authentic assessment. *Middle School Journal, 25*(2), 11-13.

Reis, S., Westberg, K., Kulikowich, J., Caillard, F., Hébert, T., Plucker, J., Purcell, J., Rogers, J., & Smist, J. (1993). *Why not let high ability students start school in January? The curriculum compacting study* (Research Monograph 93106). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Reis, S. M., Neu, T. W., & McGuire, J. M. (1994). Factors involved in the academic success of high-ability university students with learning disabilities. *Journal of Secondary Gifted Education, 5,* 60-74.

Renzulli, J. S. (1988). The multiple menu model for developing differentiated curriculum for the gifted and talented. *Gifted Child Quarterly, 32*, 298-309.

Reynolds, T. L. (1999). *Transforming teacher practice: A sociocultural process of change and learning*. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

Robinson, A. (1990). Cooperation or exploitation? The argument against cooperative learning for talented students. *Journal for the Education of the Gifted, 14,* 9-27.

Roehler, L., & Cantlon, D. (1997). Scaffolding: A powerful tool in social constructivist classrooms. In K. Hogan & M. Pressley (Eds.), *Scaffolding student learning: Instructional approaches and issues* (pp. 6-42). Cambridge, MA: Brookline Books.

Rogers, K. (1991). *The relationship of grouping practices to the education of gifted and talented learners* (RBDM 9102). Storrs, CT: National Research Center on the Gifted and Talented, University of Connecticut.

Rogers, K. (1993). Grouping the gifted and talented: Questions and answers. *Roeper Review, 16,* 8-12.

Romer, R. (1997). Today standards - tomorrow success. *NASSP Bulletin, 81*(590), 7-11.

Sapon-Shevin, M. (1994). *Playing favorites: Gifted education and the disruption of community.* Albany, NY: State University of New York Press.

Sapon-Shevin, M. (1995). Why gifted students belong in inclusive schools. *Educational Leadership, 52,* 64-68, 70.

Schiever, S. W. (1991). *A comprehensive approach to teaching thinking.* Boston: Allyn and Bacon.

Schlechty, P. (1997). *Inventing better schools: An action plan for educational reform.* San Francisco: Jossey-Bass.

Schumm, J., & Vaughn, S. (1991a). Making adaptations for mainstreamed students: General classroom teachers' perspectives. *Remedial & Special Education, 12,* 18-27.

Schumm, J., & Vaughn, S. (1991b). Planning for mainstreamed special education students: Perceptions of general classroom teachers. *Exceptionality, 3,* 81-98.

Schumm, J., & Vaughn, S. (1995). Getting ready for inclusion: Is the stage set? *Learning Disabilities Research & Practice, 10,* 169-179.

Schumm, J., Vaughn, S., Haager, D., McDowell, J., Rothlein, L., & Saumell, L. (1995). General education teacher planning: What can students with learning disabilities expect? *Exceptional Children, 61,* 335-352.

Scruggs, T. E., & Mastropieri, M. A. (1996). Teacher perceptions of mainstreaming/ inclusion, 1958-1995: A research synthesis. *Exceptional Children, 63*(1), 59-74.

Senge, P. M. (1990). *Fifth discipline: The art and practice of the learning organization*. New York: Doubleday.

Sharan, Y., & Sharan, S. (1992). *Expanding cooperative learning through group investigation.* New York: Teachers College Press.

Shepard, L. A., & Dougherty, K. C. (1991, April). *Effects of high-stakes testing on instruction.* Paper presented at the annual meetings of the American Educational Research Association and the National Council on Measurement in Education, Chicago, IL.

Shepard, L. A., Flexer, R. J., Hiebert, E. H., Marion, S. F., Mayfield, V., & Weston, T. J. (1995). *Effects of introducing classroom performance assessments on student learning* (CSE Technical Report No. 394). Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing.

Showers, B., Joyce, B., & Bennett, B. (1987). Synthesis of research on staff development: A framework for future study and state-of-the-art analysis. *Educational Leadership, 45*(3), 77-87.

Sicola, P. (1990). Where do gifted students fit? An examination of middle school philosophy as it relates to ability grouping and the gifted learner. *Journal for the Education of the Gifted, 14,* 37-39.

Silverman, L. K. (1990). Issues in affective development of the gifted. In J. VanTassel-Baska (Ed.), *A practical guide to counseling the gifted in a school setting* (2nd ed., pp. 15-30). Reston, VA: Council for Exceptional Children.

Slavin, R. E. (1990). Achievement effects of ability grouping in secondary schools: A best-evidence synthesis. *Review of Educational Research, 60,* 471-499.

Sowell, E. R., Thompson, P. M., Holmes, C. J., Batth, R., Jernigan, T. L., & Toga, A. W. (1999). In vivo evidence for post adolescent brain maturation in frontal and striatal regions. *Nature Neuroscience, 2,* 859-861.

Spear, R. (1992). Appropriate grouping practices for middle level students. In J. Irvin (Ed.), *Transforming middle level education: Perspectives and possibilities* (pp. 244-274). Boston: Allyn and Bacon.

Sternberg, R. J. (1996). *Successful intelligence: How practical and creative intelligence determine success in life*. New York: Plume.

Sternberg, R. J. (1997). A triarchic view of giftedness: Theory and practice. In M. Colangelo & G. Davis (Eds.), *Handbook of gifted education* (2nd ed., pp. 43-53). Needham Heights, MA: Allyn and Bacon.

Sternberg, R. J., & Grigorenko, E. (1997). Are cognitive styles still in style? *American Psychologist, 52,* 700-712.

Stevenson, C. (1998). *Teaching ten to fourteen year olds*. New York: Longman.

Stiggins, R. J. (1999a). Evaluating classroom assessment training in teacher education programs. *Educational Measurement: Issues and Practices, 18,* 23-27.

Stiggins, R. J. (1999b). Assessment, student confidence, and school success. *Phi Delta Kappan, 81,* 191-198.

Stiggins, R. J., & Bridgeford, N. J. (1982). *Final research report on the nature, role and quality of classroom performance assessment.* Portland, OR: Northwest Regional Educational Laboratory.

Stiggins, R. J., Griswold, M. M., & Wikelund, K. R. (1989). Measuring thinking skills through classroom assessment. *Journal of Educational Measurement, 26,* 233-246.

Strauss, A., & Corbin, J. (1990). *Basics of Qualitative Research: Grounded theory procedures & techniques*. Newbury Park, CA: Sage Publications.

Suplee, C. (2000, March 9). Key brain growth goes on into teens: Study disputes old assumptions. *The Washington Post*, pp. A1, A14.

Toepfer, C. F., Jr. (1977, March). *A realistic expectation of cognitive growth during transessence.* Paper presented at the annual meeting of the Association of Supervision and Curriculum Development, Houston, TX.

Tomlinson, C. (1992a). Gifted education and the middle school movement: Two voices on teaching the academically talented. *Journal for the Education of the Gifted, 15,* 206-238.

Tomlinson, C. (1992b). Gifted learners: The boomerang kids of middle school? *Roeper Review, 16,* 178-182.

Tomlinson, C. (1994a). Gifted learners: The boomerang kids of middle school? *Roeper Review, 16,* 177-182.

Tomlinson, C. (1994b). The easy lie and the role of gifted education in school excellence. *Roeper Review, 16*, 258-259.

Tomlinson, C. (1995a). "All kids can learn:" Masking diversity in the middle school. *Clearing House, 68,* 163-166.

Tomlinson, C. (1995b). Deciding to differentiate instruction in middle school: One school's journey. *Gifted Child Quarterly, 39,* 77-87.

Tomlinson, C. (1995c). *Gifted learners and the middle school: Problem or promise?* Eric Digest (EDO-EC-94-6). Reston, VA: Council for Exceptional Children.

Tomlinson, C. (1996). Good teaching for one and all: Does gifted education have an instructional identity? *Journal for the Education of the Gifted, 20,* 155-174.

Tomlinson, C. (1999). *The differentiated classroom: Responding to the needs of all learners.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C. (2001). *How to differentiate instruction in mixed ability classrooms* (2nd ed.). Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C., & Allan, S. (2000). *Leadership for differentiating schools and classrooms.* Alexandria, VA: Association for Supervision and Curriculum Development.

Tomlinson, C., Callahan, C., Moon, T., Tomchin, E., Landrum, M., Imbeau, M., Hunsaker, S., & Eiss, N. (1995). *Preservice teacher preparation in meeting the needs of gifted and other academically diverse students* (Research Monograph 95134). Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Tomlinson, C., Moon, T., & Callahan, C. (1998). How well are we addressing academic diversity in the middle school? *Middle School Journal, 29*(3), 3-11.

Tyack, D., & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform.* Cambridge, MA: Harvard University Press.

Tye, B. B. (1998). The deep structure of schooling: What it is and how it works. *The Clearing House, 71*(6), 332-334.

Tye, B. B. (2000). *Hard truths: Uncovering the deep structure of schooling*. New York: Teachers College Press.

U.S. Department of Education. (1993). *National excellence: A case for developing America's talent.* Washington, DC: U.S. Government Printing Office.

Vallerand, R., Gagne, F., Senecal, G., & Pelletier, L. (1994). A comparison of the school intrinsic motivation and perceived competence of gifted and regular students. *Gifted Child Quarterly, 38,* 172-178.

VanTassel-Baska, J. (1992). Educational decision making on acceleration and grouping. *Gifted Child Quarterly, 36,* 68-72.

VanTassel-Baska, J. (1998). *Excellence in educating gifted and talented learners* (3rd ed.). Denver, CO: Love.

Vaughn, S., Elbaum, B. E., & Schumm, J. S. (1996). The effects of inclusion on the social functioning of students with learning disabilities. *Journal of Learning Disabilities, 29*, 598-608.

Vaughn, S., & Schumm, J. (1994). Middle school teachers' planning for students with learning disabilities. *Remedial and Special Education, 15,* 152-161.

Voltz, D., & Dooley, E. (1999). Culturally responsive curricula for learners in a diverse society. In F. Obiakor, J. Schween, & A. Rotatori (Eds.), *Advances in special education: Multicultural education for learners with exceptionalities* (pp. 133-148). Stamford, CT: JAI Press.

Vygotsky, L. S. (1934, 1986). *Thought and language*. Cambridge, MA: The Massachusetts Institute of Technology Press.

Wadsworth, B. J. (1989). *Piaget's theory of cognitive and affective development* (4th ed.). White Plains, NY: Longman.

Whalen, S. (1998). Flow and engagement of talent: Implications for secondary schooling. *NASSP Bulletin, 82,* 22-37.

Wheelock, A. (1995*). Standards-based reform: What does it mean for the middle grades?* New York: Edna McConnell Clark Foundation. (ERIC Document Reproduction Service No. ED389772)

Whitmore, J. R. (1985). *Underachieving gifted students* (Report No. EDN00001). Washington, DC: National Institute of Education. (ERIC Document Reproduction Service No. ED262526)

Whitmore, J. R. (1988). Gifted children at risk for learning difficulties. *Teaching Exceptional Children, 20*(4), 10-14.

Wiggins, G., & McTighe, J. (1998). *Understanding by design.* Alexandria, VA: Association for Supervision and Curriculum Development.

Winfield, L. F. (1990). School competency testing reforms and student achievement: Exploring a national perspective. *Educational Evaluation and Policy Analysis, 12(2),* 157-173.

Wohlstetter, P. (1991). Accountability mechanisms for state education reform: Some organizational alternatives. *Educational Evaluation and Policy Analysis, 13*(1), 31-48.

Wolf, D. P., LeMahieu, P. G., & Eresh, J. (1992). Good measure: Assessment as a tool for educational reform. *Educational Leadership, 49*(8), 8-13.

Zimmerman, B., & Martinez-Ponds, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology, 82,* 51-59.

Research Monograph

The National Research Center on the Gifted and Talented
University of Connecticut
2131 Hillside Road Unit 3007
Storrs, CT 06269-3007
http://www.gifted.uconn.edu

Editor
E. Jean Gubbins

Production Assistants
Jenny Comerford
Lisa Muller
Siamak Vahidi

Reviewers
Kay Brimijoin
Nancy B. Hertzog
Nancy Peterson

Also of Interest

State Policies Regarding Education of the Gifted as Reflected in Legislation and Regulation
A. Harry Passow and Rose A. Rudnitski

Residential Schools of Mathematics and Science for Academically Talented Youth: An Analysis of Admission Programs
Fathi A. Jarwan and John F. Feldhusen

The Status of Programs for High Ability Students
Jeanne H. Purcell

Recognizing Talent: Cross-Case Study of Two High Potential Students With Cerebral Palsy
Colleen Willard-Holt

The Prism Metaphor: A New Paradigm for Reversing Underachievement
Susan M. Baum, Joseph S. Renzulli, and Thomas P. Hébert

Also of interest from the

Research Monograph Series

Attention Deficit Disorders and Gifted Students: What Do We Really Know?
Felice Kaufmann, M. Layne Kalbfleisch, and F. Xavier Castellanos

Gifted African American Male College Students: A Phenomenological Study
Fred A. Bonner, II

Counseling Gifted and Talented Students
Nicholas Colangelo

E. Paul Torrance: His Life, Accomplishments, and Legacy
Thomas P. Hébert, Bonnie Cramond, Kristie L. Speirs Neumeister, Garnet Millar, and Alice F. Silvian

The Effects of Grouping and Curricular Practices on Intermediate Students' Math Achievement
Carol L. Tieso

Developing the Talents and Abilities of Linguistically Gifted Bilingual Students: Guidelines for Developing Curriculum at the High School Level
Claudia Angelelli, Kerry Enright, and Guadalupe Valdés

Development of Differentiated Performance Assessment Tasks for Middle School Classrooms
Tonya R. Moon, Carolyn M. Callahan, Catherine M. Brighton, and Carol A. Tomlinson

Society's Role in Educating Gifted Students: The Role of Public Policy
James J. Gallagher

Middle School Classrooms: Teachers' Reported Practices and Student Perceptions
Tonya R. Moon, Carolyn M. Callahan, Carol A. Tomlinson, and Erin M. Miller

Assessing and Advocating for Gifted Students: Perspectives for School and Clinical Psychologists
Nancy M. Robinson

Giftedness and High School Dropouts: Personal, Family, and School Related Factors
Joseph S. Renzulli and Sunghee Park

Assessing Creativity: A Guide for Educators
Donald J. Treffinger, Grover C. Young, Edwin C. Selby, and Cindy Shepardson

Also of interest from the

Research Monograph Series

Implementing a Professional Development Model Using Gifted Education Strategies With All Students
E. Jean Gubbins, Karen L. Westberg, Sally M. Reis, Susan T. Dinnocenti, Carol L. Tieso, Lisa M. Muller, Sunghee Park, Linda J. Emerick, Lori R. Maxfield, and Deborah E. Burns

Teaching Thinking to Culturally Diverse, High Ability, High School Students: A Triarchic Approach
Deborah L. Coates, Tiffany Perkins, Peter Vietze, Mariolga Reyes Cruz, and Sin-Jae Park

Advanced Placement and International Baccalaureate Programs for Talented Students in American High Schools: A Focus on Science and Mathematics
Carolyn M. Callahan

The Law on Gifted Education
Perry A. Zirkel

School Characteristics Inventory: Investigation of a Quantitative Instrument for Measuring the Modifiability of School Contexts for Implementation of Educational Innovations
Tonya R. Moon, Catherine M. Brighton, Holly L. Hertberg, Carolyn M. Callahan, Carol A. Tomlinson, Andrea M. Esperat, and Erin M. Miller

Content-based Curriculum for Low Income and Minority Gifted Learners
Joyce VanTassel-Baska

Reading Instruction for Talented Readers: Case Studies Documenting Few Opportunities for Continuous Progress
Sally M. Reis, E. Jean Gubbins, Christine Briggs, Fredric J. Schreiber, Susannah Richards, Joan Jacobs, Rebecca D. Eckert, Joseph S. Renzulli, and Margaret Alexander

Issues and Practices in the Identification and Education of Gifted Students From Under-represented Groups
James H. Borland

The Social and Emotional Development of Gifted Students
Carolyn M. Callahan, Claudia J. Sowa, Kathleen M. May, Ellen Menaker Tomchin, Jonathan A. Plucker, Caroline M. Cunningham, and Wesley Taylor

Also of interest from the

Research Monograph Series

Promoting Sustained Growth in the Representation of African Americans, Latinos, and Native Americans Among Top Students in the United States at All Levels of the Education System
L. Scott Miller

Evaluation, Placement, and Progression: Three Sites of Concern for Student Achievement
Samuel R. Lucas

Latino Achievement: Identifying Models That Foster Success
Patricia Gándara

Modern Theories of Intelligence Applied to Assessment of Abilities, Instructional Design, and Knowledge-based Assessment
Robert J. Sternberg, Elena L. Grigorenko, Bruce Torff, and Linda Jarvin

Giftedness and Expertise
Robert J. Sternberg, Elena L. Grigorenko, and Michel Ferrari

Academic and Practical Intelligence
Robert J. Sternberg, Elena L. Grigorenko, Jerry Lipka, Elisa Meier, Gerald Mohatt, Evelyn Yanez, Tina Newman, and Sandra Wildfeuer

Developing Creativity in Gifted Children: The Central Importance of Motivation and Classroom Climate
Beth A. Hennessey

Intelligence Testing and Cultural Diversity: Concerns, Cautions, and Considerations
Donna Y. Ford

The Feasibility of High-end Learning in a Diverse Middle School
Catherine M. Brighton, Holly L. Hertberg, Tonya R. Moon, Carol A. Tomlinson, and Carolyn M. Callahan

Equity, Excellence, and Economy in a System for Identifying Students in Gifted Education: A Guidebook
Joseph S. Renzulli

NRC G/T

The National Research Center on the Gifted and Talented Research Teams

University of Connecticut

Dr. Joseph S. Renzulli, Director
Dr. E. Jean Gubbins, Associate Director
Dr. Sally M. Reis, Associate Director
University of Connecticut
2131 Hillside Road Unit 3007
Storrs, CT 06269-3007
860-486-4676

Dr. Del Siegle

University of Virginia

Dr. Carolyn M. Callahan, Associate Director
Curry School of Education
University of Virginia
P.O. Box 400277
Charlottesville, VA 22904-4277
804-982-2849

Dr. Mary Landrum
Dr. Tonya Moon
Dr. Carol A. Tomlinson
Dr. Catherine M. Brighton
Dr. Holly L. Hertberg

Yale University

Dr. Robert J. Sternberg, Associate Director
Yale University
Center for the Psychology of Abilities, Competencies, and Expertise
340 Edwards Street, P.O. Box 208358
New Haven, CT 06520-8358

Dr. Elena L. Grigorenko