The Effectiveness of Curriculum Compacting in First Grade Classrooms

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This article provides new information about how compacting can be effective with first grade high ability students in a rural Alabama school district. Curriculum compacting was designed to eliminate already-mastered content and to provide students with enrichment activities in the time saved. The study, which replicated some aspects of the National Research Center on the Gifted and Talented curriculum compacting study, includes qualitative and quantitative data from teachers, students and parents concerning the positive attitudes of the first grade treatment group. There was a significant difference between the treatment and control group teachers' responses regarding their use of compacting, with treatment teachers reporting greater use of compacting practices. There was also a significant difference between treatment and control parents' responses regarding their attitudes of curriculum compacting and replacement enrichment activities, with treatment parents reporting more positive attitudes. Results indicate that treatment group students' responses were slightly higher than control group students' responses regarding student preference toward school subjects.

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Efforts are made continually to improve our educational system and provide excellence in educational curriculum. Yet, many average and above average students - sometimes up to 90 % - demonstrate mastery of subject area on assessments of reading before instruction is provided (Taylor & Frye, 1988). Researchers have found that in spite of this knowledge, little differentiation of the curriculum is attempted (Taylor & Frye; Reis & Renzulli, 1992). This lack of differentiation may cause high ability students to exhibit frustration and boredom with the drill and practice of content they have already mastered. Teachers may also feel frustrated because the duty of modifying curriculum for a range of individual student needs, abilities, and interests seems an insurmountable task (Reis & Renzulli).

Despite the challenges of teaching high ability students in the regular classroom, there are strategies that teachers can use to effectively educate these exceptionally bright students. One such strategy is curriculum compacting, a technique used to modify the regular curriculum to meet the needs of gifted students in the regular classroom (Reis, Westberg, et al., 1993). Gifted and talented students, as well as all learners who exhibit strengths or high levels of interests, can benefit from the use of curriculum compacting (Westberg, 1995).

Students who have already mastered the regular curriculum need to be offered more challenging content to improve their educational experiences in the regular classroom (Reis & Renzulli, 1992). Notwithstanding the availability of a variety of curriculum modification techniques, including curriculum compacting, teachers fail to use researched strategies to better meet individual students' needs (Reis, Westberg, Kulikowich, & Purcell, 1998). The result is often underachievement and negative attitudes toward school (Feldhusen, 1989). Research suggests, however, that gifted students who demonstrate strengths and interests in specific areas can benefit and attain a higher degree of educational excellence from curriculum compacting (Reis et al., 1993).

Purpose and Design of the Study

Most schools seem to recognize and attempt to remedy the individual curricular needs of students requiring additional instruction. In fact, much time and money is spent planning and implementing remedial experiences in our schools, yet high achieving students very often have little or no assistance with curricular modifications in the classroom (Renzulli & Reis, 1998). Teachers claim lack of time, lack of enrichment materials, lack of administrative support, and lack of training regarding gifted students as some of the reasons for not compacting students' assignments. Still other teachers believe that gifted students should be required to complete all assignments the other students complete, even though gifted students may have already mastered the work (Reis & Westberg, 1994). Reis states that "curriculum modification or compacting is the exception rather than the rule for gifted students. This lack of curriculum modification may be the single largest reason for underachievement in this population." (Kirschenbaum, 1995, p. 24). The use of curriculum compacting in the regular classroom for high ability students seems paramount in meeting their educational needs and, according to Reis, should not be an option (Kirschenbaum).

Due to the scarce data on curriculum compacting in early elementary education, it was the purpose of this study to add to the literature concerning the effectiveness of this strategy in first grade classrooms. Specifically, the researcher found no published studies regarding compacting with first grade students. The main rationale for the first grade curriculum compacting project was to eliminate already mastered curriculum and offer enrichment or acceleration activities to high ability first grade students in the regular classroom. This study examined the effectiveness of curriculum compacting in first grade classrooms in elementary schools in a rural Alabama school district. The researcher sought to answer many questions regarding teachers' use of compacting, students' attitudes of content area preferences and the observations

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and attitudes of parents whose children's work was compacted. The study attempted to address the following hypotheses:

Hypothesis 1. Treatment group teachers who implement curriculum compacting and enrichment replacement activities will demonstrate more positive changes by using more curriculum modifications and enrichment activities than control group teachers.

Hypothesis 2. Treatment group students who receive the curriculum compacting and enrichment intervention will demonstrate more positive attitudes toward school subjects than control group students.

Hypothesis 3. Parents of treatment group students will demonstrate more positive attitudes than parents of control group students regarding their child's classroom enrichment and curriculum activities.

Review of Related Literature

A review of the literature revealed that there have been few articles written in the past several years concerning the effects of curriculum compacting and none were found concerning first grade students. The related research highlights three main topics: problems with current curriculum, curricular modifications and, specifically, curriculum compacting.

Problems With Current Curriculum

Problems with current curriculum seem to point to the decreasing difficulty of textbooks used in schools since the 1940s (Chall & Conard,1991; Reis & Renzulli, 1992; Troxclair, 2000). This "dumbing down" of textbooks was reported in the early 1980s by the former secretary of education Terrel Bell (Reis & Renzulli, 1992). Specifically, texts have decreased two grade levels over the past two decades (Kirst, 1982). The newer the text, the easier the text maturity and difficulty level (Chall & Conard, 1991). It has been suggested that the decrease in difficulty is due to external pressures with little consequence given to educational excellence (Altbach, Kelly, Petrie & Weis, 1991). Textbook adoption committees adhere to texts geared toward the least-able students regardless of high ability students' needs (Bernstein, 1985). However, the ideal text for effective learning would be slightly above the students' functioning level (Chall & Conard).

The repetition of textbook material is also a problem for gifted students in the regular classroom. High ability students spend more time drilling and practicing content and skills they have mastered than they spend learning challenging content. Repetition is overly prevalent in our schools, which may lead many high ability students to become bored and, ultimately, underachievers in the classroom (Reis & Purcell, 1993; Renzulli & Reis, 1985). Covering material more than once can be academically deadly for high ability students who "got the point the first time or knew it even before that" (Kennedy, 1995, p. 233). Gifted students, like all students, deserve opportunities to excel and achieve to their fullest potential. Yet, high ability students are faced daily with the saturation of the same material they may have studied for the past several years. This frustration of repetition causes many problems for students and parents (Goree, 1996).

Over the past 30 years, research has demonstrated that most teachers have relied extensively on textbooks for instruction. This overreliance on texts poses a potential problem for students learning new content. Teachers' overuse of texts is detrimental to gifted students, especially since there appears to be a problem in matching the difficulty level of textbooks and the needs of high ability students (Renzulli & Reis, 1998). McCutcheon (1980) discovered that teachers utilized texts for 85% - 95% of instruction in the important subject areas of math and reading. In essence, the curriculum consists of little modification from the textbook. Harms and Yager (1981) proclaim that over 90% of teachers utilize only the science textbook in 90% of their science lessons. Thus, the science curriculum becomes the textbook. Former Secretary of Education, Terrell Bell, stated that as much as 95% of instruction in American schools is based on textbooks. He criticized this equation of textbooks and the curriculum (Reis, Westberg, et al., 1993).

Teachers may also play a role in the problem of matching the curriculum to high ability students. They often think there will be too much paperwork to individualize the gifted student's assignments. In today's society of state mandatory testing, pressure to cover the curriculum decreases teachers' tendency to eliminate previously mastered work for gifted students. Many teachers feel that it is not fair for them to exclude high ability students from the rest of the class merely because they already know the information (Kirschenbaum, 1995). By these practices, teachers are adding to the curriculum problem. In a national study of over 7,000 third- and fourth-grade classrooms, it was reported that high ability students spend the majority of their time in regular classrooms, yet, most classroom teachers made very few modifications in curriculum for these students (Archambault, Westberg, Brown, Hallmark, Zhang, & Emmons, 1993). The survey also reported that more than 60% of teachers have never had any type of inservice or training to meet the curricular needs of gifted students. Gifted students may not be challenged enough in the classroom to demonstrate their full potential because they seem to get by with little effort (Winebrenner & Berger, 1994). Learning less seems to be the trend for gifted students rather than learning and exploring challenging content (Reis & Renzulli, 1992). America's brightest students have become accustomed to the practice of "getting by." They realize early in their school career that doing their best and completing assignments quickly rewards them with more of the same rather than new and challenging activities.

Schools often face problems in meeting the additional needs of students who perform ahead of their age-mates (Winner & Karolyi, 1998). All too often, the most capable students are left to fend for themselves or asked to teach students who need extra assistance. These capable students are lacking the challenging education they so desperately need in the classroom and thus waste valuable time that could be spent in productive, motivating activities. Because of the deficit of educational value to high ability students, schools become places in which they exert minimum effort and grow to dislike (Kennedy, 1995).

Curricular Modifications

There are, however, solutions to the dismal plight of these high ability learners. Curriculum can be modified to better meet the needs of high ability students through strategies that differentiate the curriculum: higher level questioning skills, curriculum compacting, independent study, tiered assignments,

flexible grouping and the use of advanced content (Reis et al, 1998). Tannenbaum (1986) describes a technique called telescoping which allows students to complete basic skills in as little time as possible and eliminate already-mastered skills and content. Van Tassel-Baska (1985) describes a similar technique in her curriculum model for gifted students, which compresses content. Another curriculum modification strategy, flexible grouping, is used by scheduling students in groups based on interests, preferences, learning styles and achievement levels (Renzulli & Purcell, 1996). Students are assessed frequently, which allows them opportunities to move from group to group.

Curriculum Compacting

The purpose of curriculum compacting as an instructional strategy is to provide high ability students with enrichment opportunities over and above the regular school curriculum. Compacting involves modifying the instruction by eliminating already-mastered curriculum (Troxclair, 2000; Winebrenner, 2003). These opportunities provide students with the academic challenge they need and are specific to their individual strengths and interests. The use of curriculum compacting has been found to motivate underachieving students to complete assignments so they can pursue topics of their interests (Reis & Renzulli, 1992). Curriculum compacting is a valuable strategy designed to provide evidence of content and basic skills mastery and to "buy time" for appropriate enrichment activities (Clark, 1992, p. 297). It allows students to progress through the content at a pace comparable to their ability levels and provides opportunities to pursue topics of interest (Winebrenner).

Renzulli and Reis (1998) describe compacting as a three-step process. The first step is to define the objectives or outcomes of the instructional unit. Teachers may use curriculum guides, scope and sequence charts, and teachers' manuals to determine what material is repeated in order to eliminate or modify the content. The second step is to identify the students who may benefit from this strategy, those who have already mastered the objectives determined in step one. Pretesting the entire class prior to the introduction of a new unit or skill is a common method in the compacting process. Teachers may use a matrix to analyze students' test results to determine who can benefit from compacting. Teachers may also examine previous test scores or a previous teacher's assessment of a student's work. If all of the content has not been mastered, teachers may assess only the specific objectives in the unit that the student has not yet mastered. The third step in the compacting process, replacement enrichment or acceleration activities, is decided by the teacher and the student. Enrichment or acceleration activities should be provided for students once the curriculum is compacted. Enrichment experiences might include independent investigations, mini-courses or alternative reading assignments. Acceleration activities might include pursuing material in the next unit of the curriculum, studying the textbook from the next grade level or completing other advanced assignments.

Renzulli and Reis (1998) advocate compiling data in a Total Talent Portfolio (TTP) that details the student's strengths and also includes information concerning the student's abilities, interests, and learning styles. By examining this data, more appropriate replacement activities can be planned for the individual student. When planning replacement activities for step three in the compacting process, time, space, and availability of materials should be considered (Renzulli & Reis). Students should understand the process of compacting, the time frame for completion and the assessment methods. Students should also be aware that they are expected to master the work at a high level. A vital aspect of modifying the curriculum is student interest.

Teachers should avoid administering "more of the same" work to students who complete tasks early and easily. Instead, educators should assign different, more complex work to promote the wellbeing of gifted students in the regular classroom (Kennedy, 1995). Teachers are discouraged from giving "in addition to" work defined as rote drill. Rather, they are encouraged to give "instead of" enrichment that allows students to work on assignments of interest (Delisle, 1992, p. 56). More of the same work is not the purpose of compacting. Rather, increasing the academic challenge of high ability students should be the major goal of compacting (Renzulli & Reis, 1998).

For over 25 years, studies have shown that curriculum compacting has been beneficial to high ability students (Renzulli & Reis, 1985; Renzulli & Smith, 1978; Troxclair, 2000). Compacting is effective in modifying curriculum for gifted students because it allows the teacher to address the needs of all the students in the regular classroom (Goree, 1996). Through the use of curriculum compacting, students' self-esteem is enhanced (Winebrenner, 2003). Compacting helps develop students' self-esteem "based on the 'I am recognized for what I can do academically' principle" (Bailey, 1992, p. 55). Compacting provides opportunities for students to develop decision-making skills and learn about topics not normally taught in the curriculum (Bailey). Curriculum compacting is one of the eleven forms of accelerative practices suggested for use with high ability students. When curriculum compacting is practiced, "the student begins each school year at his or her actual level of performance in each subject - results in significantly positive academic effects, especially in mathematics." (Rogers & Kimpston, 1992, p. 59).

Curriculum compacting is an effective instructional strategy that assists teachers in differentiating instruction for advanced learners (Reis, Westberg, et al., 1993; Tomlinson, 1995). Through extensive investigations, researchers have found that elementary teachers can eliminate from 24% to 70% of high ability students' curriculum by compacting (Reis & Purcell, 1993). While the process of curriculum compacting is one requiring time and effort for teachers and students, it saves teachers valuable time when they have learned to implement compacting on a regular basis. Delisle (1995) describes his experiences with curriculum compacting when he took a leave of absence from college teaching to teach in an elementary school again. He defines compacting as a process that occurs naturally, as a "mindset" and a "philosophy" that teachers use to "adjust the curriculum in a manner that [takes] advantage of the individual and collective talents possessed by their students" (p. 245).

Experts and practitioners in the field of gifted education applaud the research and support the use of curriculum compacting. In her book *Teaching Gifted Kids in the Regular Classroom,* Winebrenner (1992) outlines curriculum compacting as an effective option for eliminating repeated material. Starko (1986) provides step-by-step

directions for inservice strategies on curriculum compacting in her book, *It's About Time.* In the book *Teaching Young Gifted Children in the Regular Classroom,* the curriculum compacting process is explained through the use of a banking metaphor (Smutny, Walker, & Meckstroth, 1997). The teacher should imagine a:

> "time bank" in your classroom with individual "checking accounts" and "savings accounts" for children. A child's checking account is a given amount of time he needs to learn basic information- time spent in whole group instruction and activities. Some children will need more or less time in their individual checking accounts. The savings account is the time the child has "saved" by documenting that he knows the information. You need to ask yourself: How will I know who has some "savings"? How will children spend their "savings"? How will I organize the curriculum so children's "savings" yield the best "returns"? (p. 41)

Curriculum compacting is "organized common sense" and the "surgical removal" of repetitious drill and practice" (Renzulli & Reis, 1997, p. 145). "Until high-quality textbooks are universally available, it is essential to deal with the curriculum situation as it currently exists" (p.147).

Curriculum modifications can be useful in differentiating the instruction for gifted students and may also remedy some of the problems associated with the decreasing difficulty of textbooks and the repetition that plague these students. Curriculum compacting helps to modify curricula and provide appropriate, challenging enrichment and/or acceleration experiences. There are many benefits of curriculum compacting including the elimination of already-mastered content, opportunities for challenging replacement activities, the advancement of students' decision-making skills and the development of students' self-esteem.

Methodology

The design of the first grade curriculum compacting project was a quasi-experimental matched-pair design. There were both qualitative and quantitative aspects of the study. It was assumed that first grade students were randomly assigned to their respective classrooms prior to the beginning of the school year. It was also assumed that students, teachers, and parents gave responses that accurately reflected their attitudes and observations on measures used in the study.

Subjects

The participants of the first grade curriculum compacting project were 70 first grade students enrolled in two rural Alabama schools. The average age of the students was 7 years 8 months. There were 35 females and 35 males in the study. Thirty-five students, 3 of whom had been identified with a learning disability (LD), participated in the treatment group. The remaining 35 comprised the control group. There were 55 Caucasians and 15 African Americans total students in the study (30 Caucasians and 5 African Americans in the treatment group and 25 Caucasians and 10 African Americans in the control group). All students in the study lived in rural communities and were from low to medium socioeconomic backgrounds.

Students were selected by cluster sampling based on high ability classrooms. The principals and the special education coordinator chose the top ability first grade classrooms in the county's school as determined by district-wide reading and math readiness measures for first grade. Top ability first grade classrooms were determined by district-wide reading and math readiness measures for entrance to first grade and the end of the first semester (of first grade) math and reading report card grades. The four classrooms used in the study were chosen at random from the selection of top ability first grade classrooms. The average of participating students' first semester report card grades in math was 91 and the average in reading grades was 89. These scores and grades demonstrate above-average ability in the first grade students who participated in the study. The four classrooms used in the study were randomly assigned to either experimental or control groups.

Students' parents signed permission forms authorizing their child's participation in the project prior to initiating the study. Parents also volunteered and gave written consent to participate in the study by completing a questionnaire at the projects' conclusion. Superintendent and building principals were provided with details of the project and gave permission and full support to the curriculum compacting project. The teachers who participated in the study gave written consent to participate prior to initiating the study. The four teachers in the study have varied educational background and experience as indicated on the *Teacher Data Form.* One teacher had completed a Bachelor of Science degree and three had completed Master of Arts degrees. The range of teaching experience was from 6 to 26 years.

Teacher Instruments

Teacher Data Form. The form used to collect teacher information in the original 1993 study conducted by Reis, Westberg, et al. at the National Research Center on the Gifted and Talented (NRC/GT) was used in this study as well. The *Teacher Data Form* solicited educational and teaching experience information as well as data concerning gifted education inservice and graduate courses, amount of planning time, availability of enrichment resources, and availability of pretests and curriculum guides. The four participating teachers completed *The Teacher Data Form* prior to the study.

The *Compactor Form.* The *Curriculum Compactor* form developed by Renzulli and Smith (1978) was used by treatment teachers to document the content areas in which students exhibit strengths. The form was completed to indicate procedures used to demonstrate mastery of content and to cite enrichment or acceleration activities completed by students in the time saved through compacting. Treatment group teachers completed this instrument for individual students and groups of students throughout the duration of the study as students demonstrated evidence of skill and content mastery.

The Classroom Practices Questionnaire. The form was developed for and used in the 1993 NRC/GT compacting study. The *Classroom Practices Questionnaire (CPQ),* was also used in this study to assess teachers' classroom practices related to curriculum compacting. The *CPQ* contains 17 questions that teachers are asked to rate from "never" to "always" on a scale from 0 to 7. The questionnaire provides teachers options to respond to three open-ended questions about content areas compacted, percentages of basic skills compacted and use of compacting in the future. The internal consistency

reliability coefficient was .85 with the 436 second through sixth grade teachers in the NRC/GT study. The internal consistency reliability coefficient was .8961 with the sample of first grade teachers in this study. The *CPQ* was completed by all four teachers at the conclusion of the study.

Student Instrument

The Content Area Preference Scale (CAPS) scale was originally developed by the NRC/GT to measure student preference for school subjects (i.e., reading, math, science, and social studies) in second through sixth grade students. The researcher modified the *CAPS* for use with first grade students in this study. The *CAPSm* consists of ten 3-point Likert-type items in which students are instructed to circle either a happy face (student agrees with the statement), an uncertain face (student neither agrees nor disagrees with the statement), or a sad face (student disagrees with the statement). The original *CAPS* included 20 such items in the same format. Reliability coefficients for the reading, math, science, and social studies subscales were .6173 as determined by Cronbach's Alpha (Reis, Westberg, et al., 1993). The *CAPSm* was administered to treatment and control groups at the conclusion of the curriculum compacting intervention study.

Parent Instrument

In an attempt to collect data from all sources possible, a *Parent Observation Questionnaire (POQ)* was developed by the researcher to assess parental attitudes of students' curriculum and enrichment experiences in the regular classroom. It consists of seven items rated from "almost never" to "almost always" on a scale of 1 to 5. Specific items included are the following: "My child has had many opportunities for creative activities," "My child has benefited from a variety of stimulating enrichment activities in his/her classroom," and "My child has a positive attitude about his/her school work." Parents also had opportunities to write additional comments on the questionnaire. The *POQ* was sent home to parents of all treatment and control group students who participated in the project for completion. Parents returned the *POQ* anonymously to the researcher. The treatment group and control group parent questionnaires were printed on two different colors of paper to distinguish between groups.

Procedure

Initially in the project, the participating treatment teachers were trained in a 2-hour curriculum compacting inservice session by the gifted resource room teacher. The inservice consisted of treatment teachers viewing two videos on curriculum compacting with supplementary handouts, forms, and articles. Teachers were also shown how to complete a Compactor for students with examples of how to compact different content areas. Teachers were given handouts on step-by-step compacting instructions, and provided with additional information from resource books on curriculum compacting. As supplemental material, books on curriculum and enrichment were made available to assist treatment teachers in the regular classroom.

The gifted resource room teacher explained to treatment teachers that the project would entail compacting work for students who had already mastered skills and content, completing compactor forms, completing a *Teacher Data Form* and providing enrichment alternative activities. Teachers were instructed they could use pretests to determine student strengths and inventories to determine student interests in the compacting process. The gifted resource room teacher also helped to provide resources and materials for the enrichment replacement activities. The curriculum compacting project was implemented during the spring semester, with approximately 17 weeks of enrichment intervention. Classroom visits and phone calls during planning periods between treatment teachers and the gifted resource room teacher facilitated communication and included further consultation and training when necessary. In addition to activities provided by classroom teachers, the gifted resource teacher provided weekly enrichment activities to the first grade treatment students during the time made available by compacting the curriculum. Examples of enrichment activities provided by the resource room teacher are listed in Table 1. Control group classrooms did not receive any training, assistance, or intervention in curriculum compacting or enrichment services.

Results

A t-test for independent samples was used to compare the means and standard deviation of the treatment group's and the control group's student, teacher, and parent quantitative data to test the hypotheses and determine if there were significant differences between the groups. Data from semi-structured interviews and completed forms and questionnaires were analyzed to examine themes from the qualitative aspects of the study.

It was hypothesized that treatment group teachers who implement curriculum compacting and enrichment/acceleration replacement activities would demonstrate more positive changes by using more curriculum modification and enrichment activities than control group

Enrichment Activities Provided by the Resource Room Teacher

1. Chemistry – Experimenting with a non-Newtonian fluid
2. Chemistry – Experimenting with oil and water, bubbles
3. Chemistry – Experimenting with stacking liquids
4. Quilting – Field trip to visit a quilter, Making quilt squares
5. Making poetry books
6. Biologist guest speaker – Animals
7. Animal Booklets
8. Study of the American Flag – Making flags
9. Sign Language
10. Writing Fables
11. Study of America and Presidents
12. Writing stories – Making stick puppets
13. Writing stories – Making accordion books
14. Animal/Nature Study – Field trip to an Ecological Center
15. Study of famous females
16. Cartooning
17. Writing a First Grade Book of Manners
18. Pet stories and pictures
19. Paper Bag Puppets and Story Telling

Table 1

teachers as compared on measures of the *Classroom Practices Questionnaire (CPQ).* Second, it was hypothesized that first grade treatment group students who receive curriculum compacting and enrichment or acceleration replacement activities would demonstrate more positive attitudes toward school subjects than control group students who did not receive curriculum compacting intervention as compared on measures of the modified *Content Area Preference Scale (CAPSm).* Third, it was hypothesized that parents of treatment group students would demonstrate more positive attitudes than parents of control group students about enrichment and curriculum as compared on measures of the *Parent Observation Questionnaire (POQ).*

Quantitative and Qualitative Research Questions

Comparisons were made between the treatment and control groups teachers' curriculum classroom practices, between the treatment and control groups students' attitudes toward school subjects, and between the treatment and control groups parents' attitudes of enrichment in the classroom. The results are reported after each research question.

Research question 1a. In what content areas and to what extent do teachers modify instructional practices and regular material to meet the needs of gifted and talented first grade students in the regular classroom?

The teachers' responses on the *Classroom Practices Questionnaire* along with the responses in the first column of the completed compactors were examined to reveal the content areas the treatment group teachers used for compacting students' work. Curriculum modifications were made most often in language arts and math. Teachers used curriculum compacting in reading and science as well, with two documentations of compacting in social studies. Table 2 details the subjects compacted in the order of frequency that curriculum modifications were made and the percentage of frequency each subject was documented on the compactor forms during the study.

To determine the extent to which treatment teachers compacted student assignments, the responses to questions on the *CPQ* were examined. Treatment teachers reported the percentage of basic skills curriculum they eliminated in content areas during the semester. Treatment teacher one reported that 25% to 50% of students' work was compacted while the second treatment teacher modified 25% to 35% of students' basic skills curriculum. The treatment group teachers compacted a mean of 32.5% of material during the study.

Research question 1b. What are the strategies used by first grade teachers to determine the curricular strength areas of students and their mastery of the regular curriculum?

Because teachers reported that first grade students' curriculum cover short time periods, they compacted by activities, chapters, and units rather than by marking periods. Some examples of math units that were compacted include counting money and addition and subtraction fact families. Examples of language arts units compacted include how to write "telling" and "asking" sentences and how to use pronouns.

Treatment teachers were similar in how specifically they listed the content to be modified. For example, on some compactors, teachers listed math measurement as the specific content to be compacted, while on other compactors, the compacted content was documented only by subject area such as math or language. Treatment Teacher 1 specifically listed the concept on 59% of compacters and listed the subject only on 41% of the compacters. Treatment Teacher 2 specifically listed the concept on 58% of compactors and listed the subject only on 42% of the compactors.

Treatment teachers varied in how they measured proficiency and defined mastery of the regular curriculum. In 76% of the compactors, teachers used pretests or unit tests. Teachers used other strategies including questioning, individual interaction with students and teacher, and cooperative learning in 24% of the compactors. Teachers documented the proficiency standard of curriculum mastery in 42% of the compactors. The average for student proficiency standard documented was 96%. The range of proficiency that treatment teachers required students to master was from 80% to 100%.

Research question 1c. What types of replacement activities are used by teachers and does a difference exist between treatment groups with respect to the replacement strategies?

Both treatment teachers used a variety of replacement activities. Treatment Teacher 1 used enrichment activities in 100% of the curriculum modifications. Treatment Teacher 2 used enrichment activities for students in 75% of the modifications made and used acceleration activities in 25% of the replacement activities. Students who were accelerated went to a 2nd grade teacher's classroom during the assigned content area time period for that subject. The enrichment replacement activities documented by teachers are listed in Table 3. Acceleration activities documented by Treatment Teacher 2 included math, journal writing, and computer time spent with the 2nd grade.

Research question 1d. Is there a difference among the treatment groups regarding teachers' use of compactor forms in the regular classroom?

Subject Areas Selected for Curriculum Compacting in Order of Frequency

Subject Area	Order of Frequency	% Documented on Compactors
Language Arts	1	34%
Math	2	31%
Reading	3	16%
Science	4	13%
Social Studies	5	6%

Table 2

Strategies for Enrichment Activities Used by Treatment Teachers

1. Computer activities
2. Creative writing
3. Book reports
4. Research
5. Interest and learning centers
6. Math activities (graphing, using math instruments and tools)
7. Folder games
8. Story telling
9. Making games
10. Small group writing activities
11. Free reading time
12. Science projects
13. Making projects of choice (bird feeders)
14. Art projects
15. Social studies puzzles

Table 3

Treatment Teacher 1 compacted individual students' and small groups of students' work during the study. Compacting was done in the content areas of math, language arts, reading, science, and social studies. The teacher reported that 90% to 95% of the compactors reflected students' interests and preferences in the replacement activities.

Treatment Teacher 2 used compacting with four students and compacted their assignments individually throughout the duration of the study. The teacher chose these high ability students at the onset of the project and compacted basic skills for them when necessary. Compacting modifications were made in the content areas of math, language arts, and reading. The teacher stated that 75% to 80% of completed compactors reflected the individual students' input or interests in the replacement activities. The mean interest input from students for replacement activities was 85% for both treatment teachers.

Research question 2a. Is there a difference between the treatment groups and the control groups regarding classroom teachers' practices and treatment teachers' decisions about whether they will compact curriculum in the future?

Responses from treatment and control group teachers on the first 17 items on the *Classroom Practices Questionnaire* were analyzed to examine the results of the first part of this question. The 17-item questionnaire contains statements concerning curriculum practices to be rated by teachers on a 0 to 7 point scale (0 = never, 7 = always). A *t*-test for independent samples was used to determine if a significant difference existed between the treatment and control group teachers' responses regarding classroom practices used by teachers. The *t*-test indicated that there was a significant difference in favor of the treatment group ($t = 2.487$, $df = 2$, $p = .0655$). The mean response for treatment group teachers was 108 while the control group teachers' response mean was 79. See Table 4 for the means and standard deviations of the teachers' practices.

To further analyze this question, treatment and control group teacher responses were examined at the conclusion of the study to an open-ended question on the *CPQ*. "Will you continue to use this method of adjusting curriculum to meet the needs of above average ability students in the future? Why or why not?" The two control group teachers commented that they were interested in learning about the process of curriculum compacting to "make the curriculum work better for every student" and "to meet individual needs." The treatment teachers made the following comments:

Treatment Teacher 1:

> Yes, this makes learning fun. Children can't wait to come to school and complete their activities. My principal is very supportive of the curriculum compacting project and she is interested in "looping" this group of students. Students stay together as a group with their teacher for two to three school years. For example, I will have my students for first and second grades, and then one teacher will keep this group of students for the third and fourth grades. I have been to a workshop on looping. The reports state there have been many positive results. I am really excited about being able to keep this group of students for their second grade year. I think what we have done this year will be easily carried over to next year, including the curriculum compacting process. The idea of looping this group of students came out of this year's compacting project. I think it will be interesting to see the results these projects have on this group of students in the long run.

Treatment Teacher 2:

> Yes, because it allows the teacher to continue with other areas of the curriculum or extend a particular unit of interest to these students. Students enjoy this as well because of the extended activities. I have been "inspired" to compact curriculum for students who demonstrate high ability and interest in content areas. I want to reach these students and help expand their knowledge. I have talked to other teachers about testing students in subject areas. Since participating in this project, I will always pretest students and if they have mastered the work, I will use compacting. By doing so, I can have time to teach other concepts to these students and allow them more time during the semester to cover other topics and pursue more content. I had originally thought that curriculum compacting would be very time consuming with a lot of paper work. However, I have saved time through this process. I have also told other teachers about how time efficient compacting is. They seem interested in the process, now. Since participating in this project, I hope to help make some positive changes in my school. Next year, we are going to partially departmentalize and three of us will team-teach in the first grade at our school. Hopefully, what I have learned through this experience can help me to vary from the basic skills and

Means and Standard Deviations of CPQ, CAPSm, and POQ

Group	*N*	Mean	Std. Deviation	Std. Error Mean
Teacher Practices on CPQ				
Treatment	2	108	8.49	6
Control	2	79	14.14	10
($t = 2.487$, $df = 2$, $p = .0655$)				
Student Attitudes on CAPSm				
Treatment	35	28.34	2.25	.38
Control	34	27.97	2.11	.36
($t = .709$, $df = 67$, $p = .2405$)				
Parent Attitudes on POQ				
Treatment	20	31.35	2.87	.64
Control	24	28.54	3.45	.70
($t = 2.897$, $df = 42$, $p = .003$)				

Note: *CPQ* includes 17 items rated from 0 (Never) to 7 (Always); *CAPSm* includes 10 items rated from 1 (Sad Face), 2 (Unsure/straight Face), 3 (Happy Face); *POQ* includes 7 items rated from 1 (Almost Never) to 5 (Almost Always)

Table 4

expand our first grade curriculum. As part of my professional development program, I plan to attend several conferences on gifted education in the area of technology to allow my students opportunities for more projects and presentations as enrichment.

Research question 2b. What types of support services are available to classroom teachers as indicated on the *Teacher Data Form (TDF)*?

Teachers completed the teacher support system portion of the *TDF* which was analyzed as part of the study to determine their responses to questions concerning gifted education assistance, planning time, classroom grouping, and curriculum information. The teachers in the study stated that the gifted teacher/consultant was available to them for gifted education assistance and that enrichment and acceleration materials were available to them for use with high ability students. The teachers revealed they had from ½ hour to 3 hours of planning time available to them per week. All four teachers indicated their classrooms were heterogeneously grouped and they provide cluster grouping for all four subject areas: language arts, math, social studies, and science. All four teachers indicated they have district curriculum guides for all subject areas and that they have access to pretests in language arts and math but not to pretests in social studies and science.

Research question 3. Do first grade students whose curriculum was compacted perform differently on measures of content area preference than students whose curriculum was not compacted?

A *t*-test for independent samples was used to determine if a significant difference exists between treatment and control group students regarding content area preference. The *t*-test indicated that there was not a significant difference in favor of the treatment group students ($t = .709$, $df = 67$, $p = .2405$). The mean response on the *CAPSm* for the treatment group students was 28.343 while the mean response for the control group was slightly lower at 27.971. Students rated the 10-item questionnaire by circling either a happy face (agree), unsure face, or sad face (disagree) to indicate their attitude towards each item. See Table 4 for the means and standard deviation for the *CAPSm*.

Research question 4. Is there a difference between the treatment and control groups regarding parents' observations/attitudes about their child's enrichment activities?

A *t*-test for independent samples was used to determine if a significant difference exists between treatment and control group parental responses concerning their attitudes towards enrichment provided in their child's classroom. The *t*-test revealed that there was a significant difference in favor of the treatment group parents ($t = 2.897$, $df = 42$, $p = .003$). The mean response on the parent questionnaire for treatment group parents was 31.35. The mean response for control group parents' attitudes was 28.54. See Table 4 for the means and standard deviations of parent attitudes on the questionnaire.

Sixty-three percent of the treatment parents made positive comments on the parent questionnaire. There were no negative comments made on the 20 returned treatment group parent questionnaires. The following are some of the positive comments made by treatment parents (the names have been changed to protect students' privacy):

> Michael has really enjoyed the enrichment activities. He could list several things he has learned and has a hard time selecting his favorite. He enjoyed the chemistry activities, making "gak," stacking liquids, and observing the animals.

> I have seen my daughter excel in a lot of ways this spring. She shows more independence and I attribute a lot of this to her teacher who has provided Kalie with many enrichment opportunities.

> Angel has learned so much this semester. I want her to stay ahead and continue in this program to experience different challenges.

> These activities have given Robert a curiosity and a desire for learning. Thanks.

> My son's teacher makes learning fun and interesting. He talks a lot about the activities she does with them.

> Tabitha always shares what she did in class with me. This is an exciting and educational year for her.

> Logan is always excited to tell us all about his day. He has learned so much this year. I credit a lot of it to his teacher. She demands the very best. I am pleased with his progress and feel he is very prepared for second grade!

Twenty-four parents of students in the control group returned questionnaires. Less than two percent of control group students' parents made comments. These comments were general, for example, "We had a great first grade year." Other comments pertained to student needs.

Discussion

The major purpose of this study was to determine the effectiveness of curriculum compacting for high ability first grade students in a rural school system by eliminating already-mastered curriculum and offering enrichment activities. The two treatment group teachers were trained at the onset of the study to use the technique of curriculum compacting, to document the modifications and to implement enrichment and accelerated replacement activities. Several important findings emerged from the first grade curriculum compacting project. These results are of particular interest because data concerning the effectiveness of curriculum compacting on first grade students could not be found.

The first hypothesis was that treatment group teachers who implemented curriculum compacting and enrichment replacement activities would demonstrate more positive changes by using more curriculum modifications and enrichment activities than control group teachers. The findings were consistent with the hypothesis. There was a significant difference on the *CPQ* ($t = 2.487$, $df = 2$, $p = .0655$) between the responses of treatment group teachers (who implemented compacting with students) and control group teachers (who did not implement compacting in their classrooms). These findings are consistent with the findings of Reis and others in the Curriculum Compacting study (Reis, Westberg, et al., 1993). The difference in teacher classroom practices in this study implies a positive effect of compacting on students because teachers' willingness to make curricular modifications is of predominant importance and has been associated with teacher effectiveness.

There was an abundance of teacher information resulting from this study. Both first grade treatment teachers compacted material most often in language arts and math. Both teachers compacted in more than two subject areas during the study. Treatment teachers eliminated parts of or entire units for students who had already mastered the content. At least 25% and as much as 50% of basic skills curriculum was compacted by treatment teachers during the 17 weeks of the study. When completing the compactor forms, teachers most frequently required students to master 96% of curriculum to compact their assignments. This high expectation level indicates that treatment teachers realized the importance of skill mastery before providing students with more challenging opportunities.

The teachers used many enrichment and accelerated replacement activities including projects, reports, writing, computer, and math activities. Treatment teachers differed in these activities with Teacher 1 using enrichment activities only and Teacher 2 using both enrichment and acceleration for replacement activities. Teachers individualized class work and homework assignments. Treatment teachers revealed that they could tailor the curriculum to the individual student's needs. These teachers allowed students to work on advanced and challenging projects and to pursue topics of interest. Treatment Teacher 1 used more student input in the replacement activities listed than did Teacher 2. On average, 85% of replacement activities reflected student input, which indicates teachers' emphasis on student interest. They both reported they had access to and utilized a gifted teacher and resource materials to assist them in these replacement activities, which demonstrates the important role of a gifted specialist to classroom teachers.

The two treatment teachers in the study varied in that one teacher compacted work for individual students and the other compacted for individual and small groups of students. It is important to note that at least three of the high ability students whose assignments were compacted were learning disabled, which indicates treatment teachers' abilities to identify and serve typically underrepresented high ability students for differentiated curriculum needs. Treatment teachers' comments about compacting in the future were very positive. Both teachers stated they were eager to continue implementing curriculum compacting in the future because they believed the students in this study benefited from the strategy. Further inservice could be helpful for these and other interested teachers to improve their knowledge and practice of using compactor forms and providing replacement activities.

First grade treatment teachers note a vital difference in their classroom practices after being trained and implementing curriculum compacting for even a short period of time. Treatment Teacher 1 and the administration of the school have begun a pilot looping program with the students and teacher as a result of this study. Treatment Teacher 2 has plans to assist in team-teaching activities and training her colleagues how to implement the curriculum compacting technique in her school. She hopes the strategy will expand the learning experiences of all first grade students in her school. Teacher 2 plans to continue curriculum compacting and the practice of accelerating students to the next grade level to provide appropriate and challenging instruction to high ability first grade students.

The second hypothesis was that first grade treatment group students who received the curriculum compacting and enrichment intervention would demonstrate more positive attitudes toward school subjects than control group students. Results indicate that treatment group students' responses were slightly higher than control group students' responses on the modified *CAPS* and that treatment students feel slightly more positive about their school subjects than their control group counterparts. However, the difference was not significant ($t = .709$, $df = 67$, $p = .2405$). One possible explanation for the inconsistency with the hypothesis is that first grade students associate happy faces with teacher approval and these students might have been discriminating among the responses rather than the items. Therefore, the simplistic format of the assessment may have yielded insupportable results. Another explanation could be that first grade students have not had a long tenure in the school setting and still have a high preference for all subject areas. Finally, the one semester time limit of the study could have played a role in the results being nonsignificant. However, the findings from this study reveal that compacting already-mastered basic skills for high ability first grade students who participated in the study can be effective in offering these students more challenging educational activities.

The third hypothesis was that parents of treatment group students would demonstrate more positive attitudes than parents of control group students regarding their child's classroom enrichment and curriculum activities. The findings were consistent with the researcher's hypothesis. There was a significant difference between treatment and control group parents on the *POQ* ($t = 2.897$, $df = 42$, $p = .003$). This significance reveals that even in a short period of time, the effects of compacting can be positive and evident to parents. The results of the study indicated interesting and relevant findings regarding parent attitudes towards curriculum compacting and replacement enrichment activities. Parents of students whose assignments were compacted markedly reported positive attitudes about the curriculum strategy. Treatment parents made more positive comments on questionnaires than parents of control group students, which further emphasizes the effective impact that curriculum compacting has in the first grade classroom. Treatment students probably had a great impact on parental responses due to the nature of comments from parents concerning their child's opportunities for creative, challenging, and stimulating enrichment activities in the classroom as well as the treatment students' eagerness to inform parents of daily school enrichment activities. Treatment parents validated this postulate on the questionnaires because the results indicated that their children informed them more frequently about school activities and had a more positive attitude about school than did control parents. Parents' comments demonstrated that treatment students were excited about the new intervention and that students discussed school activities on a regular basis with their parents.

Limitations

There were several limitations of the first grade curriculum compacting project. This study was restricted to first grade students in two schools in a rural Alabama school district. Although the study was conducted for the specific purpose of examining the effects of curriculum compacting on first grade stu-

dents, the results cannot be generalized to other first grade students or schools. Since none of the first grade students in the school district had taken formal standardized tests prior to the study, treatment students could not be matched with control group students according to ability. Therefore, the treatment group students were compared collectively with the control group students. Treatment students in the study had limited access to the gifted resource room teacher's time (only one visit per week) due to class scheduling. The student instrument used in the study was modified by the researcher to fit the specific needs of first grade students for this study. The parent instrument *(POQ)* used was developed and piloted by the researcher specifically for the study. The questionnaires were sent to parents who in turn mailed them to the researcher. All parent questionnaires were not returned, which might indicate some bias. External validity could be a limitation due to the limited time of the compacting implementation.

Future Research

Additional research is needed with first grade students to determine the effectiveness of curriculum compacting in our nation's schools. Longitudinal studies could perhaps validate the findings of this study concerning the slight positive effects the intervention has on students. Longer implementation time and larger sample size is recommended to better determine compacting effectiveness. Involving more teachers and including more grade levels in future studies could greatly enhance the literature regarding curriculum compacting. Future studies should examine the attitudes of parents and closely analyze teacher data to expand the research. Future projects could incorporate weekly faculty meetings to report the efforts of compacting to teachers who are not involved in the study. Time designated for regular communication would allow more teachers to become knowledgeable about the effectiveness that compacting has on students. Inservice and staff development should be rigorous in future studies to successfully implement curriculum compacting. Teachers who feel that students must complete all class assignments require training, mentors, and enrichment consultation to clarify the goals of curriculum compacting. The gifted resource room teacher or enrichment consultant should have ample time devoted to assist throughout the project's implementation. Students should be informed of the variety of services available to them including mentorships and independent studies. Student interests and preferences for replacement activities should be of predominant importance in order for the compacting process to be effective.

Studies replicating the original compacting study done by Reis, Westberg and others (1993) could investigate achievement test scores of first grade students who receive the intervention and students who do not to determine if there are differences between their scores. The effects of school-wide curriculum compacting use on student achievement could be studied. Further examination of the affective effects of curriculum compacting and replacement enrichment activities could be analyzed to determine what role the strategy has on first grade students' self-esteem. Finally, the effects of implementing curriculum compacting in conjunction with looping and other innovative educational practices could be researched.

Conclusions and Implications

This study, like others cited in the literature, reveals the extensive percentage of basic skills content that can be eliminated for high ability students through the use of curriculum compacting (Reis, Westberg, et al., 1993). This finding along with teacher comments about textbooks indicates the need for higher difficulty level texts even in first grade classrooms and the need for challenging enrichment activities. From the project's inception, the zealous participation of the teachers and administrators in supporting and providing students with learning experiences at the appropriate level added to the success of this study. The outcome of the study reveals significantly positive effects on first grade teachers who implemented the strategy and parents of students whose work was compacted. The effects on students show some positive results. These findings should be the impetus to initiate further investigations.

When teachers use curriculum compacting with high ability first grade students, they can offer the challenging educational opportunities that these students need in order to keep them motivated in the classroom. High ability students can demonstrate their mastery of the basic material and "buy time" to pursue topics of interest during the school day rather than laboriously repeat skills. When the curriculum of first grade students is modified, they can maintain their love for learning in school. Our schools should strive to keep student interest in learning at a maximum level in order for student performance to escalate rather than decline throughout elementary school, middle school, and eventually high school. Motivation and achievement go hand-in-hand with academic success. Administrators and educators should practice strategies including curriculum compacting to increase the academic success rate of our nation's students. Differentiating the curriculum for high ability first grade students saves students the frustration of repeating skills and extends their learning experiences. The additional experiences facilitate students' opportunities for independent study, self-directed learning, and decision making. These early educational experiences provided by innovative teachers who desire to individualize the curriculum may be the key to students' task commitment and motivation. These opportunities may be essential to the development of knowledge and talents that students will use later in their school careers and, ultimately, throughout their lives.

Consistent with other research, this study reveals how beneficial curriculum compacting can be for students in the regular classroom (Reis, Westberg, et al., 1993). The first grade students whose work was modified in this study profited from curriculum compacting through additional enrichment activities. Many positive comments were made by parents about their children's enrichment experiences that verify the value of the intervention in the rural schools' first grade classrooms. Teachers also have much to gain from practicing curriculum compacting. The strategy saved time for the teachers in the study once they learned how to implement compacting and how to document the modifications. Compacting allowed them the freedom to extend their curriculum in ways they had not previously been able. The enrichment activities that treatment teachers provided sparked students' interest and increased students' learning. Teachers began investigating and using many resources to enlarge their repertoire of enrichment materials. The treatment

teachers used innovative ideas for the students' activities and were eager to learn more about serving high ability students in the regular classroom.

It seems that recent educational reform efforts have had little productive effects on high ability students in the classroom. Instead, the "dumbing down" of textbooks, the overreliance of these textbooks, the repetitious drill and practice for much of the school year, and the lack of new and challenging material, often sends the high ability student into a downhill spiral. These students learn to just get by. Is that appropriate and effective instruction for our country's brightest students? The alternative is to assist these students in reaching their fullest potential. The 30-year-old curriculum modification technique of curriculum compacting has been proven to be effective in efforts to design more appropriate differentiated instruction for bright students.

While research from previous studies reveal the significant difference that curriculum compacting can have on students' learning and self-esteem, many teachers have not yet begun practicing this modification technique. The classroom teacher can play a vital role in keeping students motivated to learn and pursue their interests in school. High ability students, in particular, need challenging activities due to the declining difficulty level of current textbooks and sparse gifted programs throughout our schools (Reis et al., 1993). The strategy of curriculum compacting has been shown to be a valuable link in the chain for the pursuit of advanced learning experiences in the regular classroom. When implemented, students who demonstrate strengths and high interest levels have much to gain from this strategy.

It can be interpreted from this project that curriculum compacting is effective in eliminating already-mastered skills for the participating high ability first grade students in a rural Alabama school district. This study indicates the impact that curriculum compacting can have on the subject preferences and attitudes of students whose work is modified. Finally, although the duration of the study was limited, teachers could be trained to successfully modify first grade curriculum to better meet the needs of their high ability students and offer them advanced learning opportunities. The overall results of this study are clear that curriculum compacting had positive effects on the first grade students in the treatment group.

High ability students can achieve the goal of greater educational excellence for which educators aim. Ultimately, the purpose of curriculum compacting is to create a challenging learning environment through appropriate enrichment activities for high ability learners after their basic curriculum is streamlined. Our educational system will improve when educators put into practice reform strategies that are proven to be effective, including curriculum compacting. We can greatly enhance the day-to-day instruction for our brightest students by modifying their curriculum and allowing them to soar to their fullest potential.

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