

## Curriculum Compacting: A Systematic Procedure for Modifying the Curriculum for Above Average Ability Students<sup>1</sup>

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As the dialogue about better ways to restructure our schools goes on, students still come to school each morning, and teachers still face the challenge of providing equitably for a broad array of differences in student abilities, interests, and learning styles. When we examine these student differences in juxtaposition to extensive differences in content, teaching styles, and teachers' personal traits, it is easy to realize that all teaching activities require a multitude of adjustments to accommodate the diversity of learning situations that can be found in any classroom. Just as teachers have experienced the frustration and the challenge of adjusting the curriculum for students who experience difficulty in learning, frustration also exists when we realize that for some students, a good deal of the material that is being taught has already been mastered, or could easily be mastered in a fraction of the time that may be required by other students. Discomfort inevitably develops for both teachers and students in these situations. Most teachers want to accommodate the special learning strengths of their above-average ability students, but are hampered by time constraints and the lack of a systematic approach for substituting more challenging work for regular classroom assignments. And students who are academically years ahead of their classmates often become frustrated because they are held accountable for daily requirements that are repetitious and unnecessary, and that often lead to boredom, underdeveloped study skills, and disenchantment with school in general.

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## **What is Curriculum Compacting?**

The policy statements of almost every school district in the nation reflect a commitment to meeting individual needs, and yet, many districts lack the capacity to put these policies into practice. An almost unlimited amount of remedial curricular material has helped teachers make necessary adjustments for lower achieving students, however, we have lacked an orderly method to make comparable adjustments for students who are already achieving at well above average levels. This article describes an easy-to-implement instructional technique for modifying the curriculum for above average ability students. This technique can also be used for any student who displays strengths or high levels of interest in one or more content areas. The procedure has proven its effectiveness in a carefully controlled national research study as well as through several years of classroom use in a variety of educational settings across the nation.

Curriculum Compacting is an instructional technique that is specifically designed to make appropriate curricular adjustments for students in any curricular area and at any grade level. Essentially, the procedure involves (1) defining the goals and outcomes of a particular unit or segment of instruction, (2) determining and documenting which students have already mastered most or all of a specified set of learning outcomes, and (3) providing replacement strategies for material already mastered through the use of instructional options that enable a more challenging and productive use of the student's time. Curriculum Compacting might best be thought of as *organized common sense*, because it simply recommends the natural pattern that teachers ordinarily would follow if they were individualizing instruction for each student. The specific steps for carrying out Curriculum Compacting in both basic skill and content areas will be described below.

## **The Bad News--Why We Need Curriculum Compacting**

It is clear that a major problem facing our schools is the lack of curricular differentiation and academic challenge for many of our most able students. Research also supports this claim. In a recent study dealing with average and above-average readers, Taylor and Frye (1988) found that 78% to 88% of fifth and sixth grade average readers could pass pretests on basal comprehension skills before they were covered in the basal reader. The average readers were performing at approximately 92%

accuracy while the better readers were performing at 93% accuracy on the comprehension skills pretests.

One reason that so many average and above average students demonstrate mastery of the curriculum is because contemporary textbooks have been "dumbed down," a phrase used in 1984 by Terrel Bell, former secretary of education. Chall and Conard (1991) concur with Bell's assessment, documenting a trend of decreasing difficulty in the most widely used textbooks over a thirty-year period from 1945- 1975. "On the whole, the later the copyright dates of the textbooks for the same grade , the easier they were, as measured by indices of readability level, maturity level, difficulty of questions and extent of illustration" (p. 2). Kirst (1982) also believes that textbooks have dropped by two grade levels in difficulty over the last 10-15 years. Most recently, Philip G. Altbach (1991), noted scholar and author on textbooks in America, suggests that textbooks, as evaluated across a spectrum of assessment measures, have declined in rigor.

Textbooks are a central part of any educational system. They help define the curriculum and can either significantly help or hinder the teacher. The "excellence movement" has directed its attention to textbooks in the past few years. American textbooks, according to the critics, are boring and designed for the lowest common denominator. They have been "dumbed down" so that content is diluted and "readability" is stressed. Textbooks have evolved over the past several decades into "products" often assembled by committees in response to external pressures rather than a coherent approach to education. Most important to many of the critics, textbooks do not provide the knowledge base for American schools in a period of reform, renewal and improvement (p. 2).

Researchers have discussed the particular problems encountered by high ability students when textbooks are "dumbed down" because of readability formulas or the politics of textbook adoption. Bernstein (1985) summarizes the particular problem that current textbooks pose for high achieving students, "Even if there were good rules of thumb about the touchy subject of textbook adoption, the issue becomes moot when a school district buys only one textbook, usually at 'grade level,' for all students in a subject or grade. Such a purchasing policy pressures adoption committees to buy books that the least-able students can read. As a result, the needs of more advanced

students are sacrificed" (p. 465). Chall and Conard (1991) also cite particular difficulties for the above-average student with regard to less difficult textbooks.

Another group not adequately served was those who read about two grades or more above the norm. Their reading textbooks, especially, provided little or no challenge, since they were matched to students' grade placement, not their reading levels. Many students were aware of this and said, in their interviews, that they preferred harder books because they learned harder words and ideas from them. Since harder reading textbooks are readily available, one may ask why they were not used with the more able readers, as were the easier reading textbooks for the less able readers. This practice of using grade-level reading textbooks for those who read two or more grades above the norms has changed little through the years, although it has been repeatedly questioned (See Chall, 1967, 1983). It would appear that, for various administrative reasons, that teachers do not use a reading textbook above the student's grade placement. The reason most often mentioned is really a question: If the third-grade teacher uses fourth grade books, what is the fourth-grade teacher going to do? (p. 111)

Further, Chall and Conard stress the importance of the match between a learner's abilities and the difficulty of the instructional task, stating that the optimal match should be slightly above the learner's current level of functioning. When the match is optimal, learning is enhanced. However, "if the match is not optimal [i.e., the match is below or above the child's level of understanding/knowledge], learning is less efficient and development may be halted" (p. 19). It is clear that the current trend of selecting textbooks which the majority of students can read is a problem for high ability students.

Recent findings by Usiskin (1987) and Flanders (1987) indicate that not only have textbooks decreased in difficulty, but also that they incorporate a large percentage of repetition to facilitate learning. Usiskin argues that even average eighth grade students should study algebra since only 25% of the pages in typical seventh and eighth grade mathematics texts contain new content. Flanders corroborated this finding by investigating the mathematics textbook series of three popular publishers. Students in grades 2-5 who used these math textbooks encountered approximately 40 to 65% new content over the course of the school year which equates to new material two to three days a week. By eighth grade, the amount of new content had dropped to 30% which translates to encountering new material once every one and one half days

a week. Flanders suggests that these estimates are conservative because days for review and testing were not included in his analysis, and concludes, "There should be little wonder why good students get bored: they do the same thing year after year" (p. 22).

In light of the findings by recent researchers, a mismatch seems to exist between the difficulty of textbooks, the repetition of curricular material in these texts, and the needs of our high ability learners. These students spend much of their time in school practicing skills and learning content they already know. All of these factors may be causing our most capable children to learn less and proceed haltingly in their development, thereby creating or encouraging their underachievement. Many of these bright students learn at an early age that if they do their best in school, they will be rewarded with endless more pages of the same kind of practice materials.

### **The Good News--Research That Offers a Practical Solution**

A study that was recently completed at the University of Connecticut's National Research Center on the Gifted and Talented (NRC/GT) examined strategies that teachers use to modify the curriculum so that it accommodates the specific strengths of high ability students. The study further examined the kinds of replacement activities that can be used to provide more appropriate levels of curricular challenge. A sample of 27 school districts and 465 second through sixth grade classroom teachers throughout the country from collaborative school districts that are a part of the NRC/GT were selected for this study. To participate, districts had to meet two criteria: no previous training or implementation of Curriculum Compacting, and a willingness to accept random assignment to a treatment group or control group. Efforts were made to recruit districts with elementary school populations that included economically disadvantaged, limited English proficient and handicapped students. The districts participating in the study represented a wide range of elementary schools from across the country, ranging from a small rural school in Wyoming to a magnet school for Hispanic students in California.

Three treatment groups which received escalating levels of staff development were used to examine the most efficient but effective method for training teachers to modify curriculum. Teachers from a fourth set of classrooms served as a control group and therefore received no training. All treatment group teachers received videotape

training and a book about the compacting process. Teachers in Treatment Group 2 also received approximately two hours of group compacting simulations conducted by an experienced trainer. The simulations developed by Starko (1986) have been a standard resource in this type of training. Treatment Group 3 received the same training as Group 2, but also had an additional 6 to 10 hours of peer coaching throughout the year, as suggested by Joyce and Showers (1983). Teachers in the control group continued normal teaching practices which did not include the use of Curriculum Compacting

Treatment and control group teachers were asked to target one or two candidates in their classrooms for Curriculum Compacting, using a set of criteria outlined in the material provided by the research team. All targeted students in treatment and control groups were tested before and after treatment with out-of-level Iowa Tests of Basic Skills (ITBS). Next-grade-level tests were used to compensate for the "topping out" effect that is frequently encountered when measuring the achievement of high ability students.

Although space does not permit a detailed presentation of the descriptive and nonparametric statistical procedures that were used to analyze data from this study, a summary of important findings will be described, and the interested reader is invited to consult a comprehensive technical report that is available from NRC/GT (Reis, *et al*, 1992)

## **How To Get More For Less!**

The most important finding might best be described as the more-for-less phenomenon! Approximately 40 to 50% of traditional classroom material was compacted for targeted students in one or more content areas. When teachers eliminated as much as 50% of regular curricular activities and materials for targeted students, no differences were observed in post test achievement scores between treatment and control groups in science, math concepts, math computation, social studies, and spelling. In language arts, the students who had between 40 to 50 % of their curriculum eliminated actually scored significantly higher on post tests than their peers in the control group. These findings clearly point out the benefits of Curriculum Compacting so far as standard achievement is concerned. Analyses of data related to replacement activities also indicated that students viewed these activities as much

more challenging than standard material.

Additional findings are based on an examination of the efficiency and effectiveness of the compacting process and the various training paradigms provided to the three treatment groups. Ninety-five percent of the teachers in the study were able to identify high ability students in their classrooms, and to document individual student strengths. Eighty percent of the teachers were able to document the curriculum that high ability students had yet to master, list appropriate instructional strategies for students to demonstrate mastery, and document an appropriate mastery standard. The most frequently compacted subject was mathematics, followed by reading, language arts, science, and social studies.

Replacement strategies consisted of three categories of activities for students: enrichment, acceleration, and other, which included activities such as peer tutoring, cooperative learning, correcting papers, and other teacher assistance tasks. Ninety-five percent of teachers used enrichment as a replacement strategy and 18% used acceleration. Many more teachers indicated they would have elected to use acceleration more frequently, but were prevented from doing so because of district policies that prohibit students from working in textbooks beyond their present grade level. Although the majority of replacement strategies reflected student interests, needs, and preferences, replacement strategies often did not reflect the types of advanced content that would be appropriate for high ability students. This finding indicates that additional staff development is necessary, especially as it relates to appropriately challenging replacement strategies. This finding was confirmed through anecdotal records, which indicated that teachers would like more access to consultant assistance from enrichment or gifted education specialists, and more training and assistance in locating and using appropriate enrichment materials.

Teachers in Treatment Group 3 used significantly more replacement strategies than did teachers in Groups 1 and 2. A significant difference in favor of Group 3 was also found with regard to the overall quality of curriculum compacting. A very encouraging finding was that a majority of teachers in all treatment groups said they would like to continue to compact curriculum (beyond the duration of the research study), and that they would like to gain more skills in using the compacting process and the broader range of materials that could be used for replacement activities.

## **How to Use the Compacting Process**

**Defining Goals and Outcomes.** The first of three phases of the compacting process consists of defining the goals and outcomes of a given unit or segment of instruction. This information is readily available in most subjects because specific goals and outcomes usually can be found in teacher's manuals, curriculum guides, scope-and-sequence charts, and some of the new curricular frameworks that are emerging in connection with outcome based education models. Teachers should examine these objectives to determine which objectives represent the acquisition of new content or thinking skills as opposed to reviews or practice of material that has previously been taught. The scope and sequence charts prepared by publishers, or a simple comparison of the tables of content of a basal series will provide a quick overview of new versus repeated material. A major goal of this phase of the compacting process is to help teachers make individual programming decisions; but a larger professional development goal is to help teachers be better analysts of the material they are teaching and better consumers of textbooks and prescribed curricular material.

**Identifying Candidates for Compacting.** The second phase of Curriculum Compacting is identifying students who have already mastered the objectives or outcomes of a unit or segment of instruction that is about to be taught. This first step of this phase consists of estimating which students have the potential to master new material at a faster than normal pace. Knowing one's students is, of course, the best way to begin the assessment process. Scores on previous tests, completed assignments, and classroom participation are the best ways of identifying highly likely candidates for compacting. Standardized achievement tests can serve as a good general screen for this step because they allow us to list the names of all students who are scoring one or more years above grade level in particular subject areas.

Being a candidate for compacting does not necessarily mean that a student knows the material under consideration. Therefore, the second step of identifying candidates consists of finding or developing appropriate tests or other assessment techniques that can be used to evaluate specific learning outcomes. Unit pretests, or end-of-unit tests that can be administered as pretests are ready made for this task,



especially when it comes to the assessment of basic skills. An analysis of pretest results enables the teacher to document proficiency in specific skills, and to select instructional activities or practice material necessary to bring the student up to a high level on any skill that may need some additional reinforcement.

The process is slightly modified for compacting content areas that are not as easily assessed as basic skills, and for students who have not mastered the material, but are judged to be candidates for more rapid coverage. First, students should have a thorough understanding of the goals and procedures of compacting, including the nature of the replacement process. A given segment of material should be discussed with the student (e.g., a unit that includes a series of chapters in a social studies text), and the procedures for verifying mastery at a high level should be specified. These procedures might consist of answering questions based on the chapters, writing an essay, or taking the standard end-of-unit test. The amount of time for completion of the unit should be specified, and procedures such as periodic progress reports or log entries for teacher review should be agreed upon. And, of course, an examination of potential acceleration and/or enrichment replacement activities should be a part of this discussion.

Another alternative is to assess or pretest all students in a class when a new unit or topic is introduced. Although this may seem like more work for the teacher, it provides the opportunity for all students to demonstrate their strengths or previous mastery in a given area. Using a matrix of learning objectives, teachers can fill in test results and establish small, flexible, and temporary groups for skill instruction and replacement activities.

**Providing Acceleration and Enrichment Options.** The final phase of the compacting process can be one of the most exciting parts of teaching because it is based on cooperative decision making and creativity on the parts of both teachers and students. Efforts can be made to gather enrichment materials from classroom teachers, librarians, media specialists, and content area or gifted education specialists. These materials may include self-directed learning activities, instructional materials that focus on particular thinking skills, and a variety of individual and group project oriented activities that are designed to promote hands on research and investigative skills. The time made available through compacting provides opportunities for exciting learning experiences such as small group, special topic

seminars that might be directed by students or community resource persons, community based apprenticeships or opportunities to work with a mentor, peer tutoring situations, involvement in community service activities, and opportunities to rotate through a series of self-selected mini-courses.

Decisions about which replacement activities to use are always guided by factors such as time, space, and the availability of resource persons and materials. Although practical concerns must be considered, the ultimate criteria for replacement activities should be the degree to which they increase academic challenge and the extent to which they meet individual needs. Great care should be taken to select activities and experiences that represent individual strengths and interests rather than the assignment of more-of-the-same worksheets or randomly selected kits, games, and puzzles! This aspect of the compacting process should also be viewed as a creative opportunity for an entire faculty to work cooperatively to organize and institute a broad array of enrichment experiences. A favorite mini-course that a faculty member has always wanted to teach, or serving as a mentor to one or two students who are extremely invested in a teacher's beloved topic are just a few of the ways that replacement activities can add excitement to the teachers' part in this process as well as the obvious benefits for students. We have also observed another interesting occurrence that has resulted from the availability of Curriculum Compacting. When some previously bright but underachieving students realized that they could both economize on regularly assigned material and "earn time" to pursue self-selected interests, their motivation to complete regular assignments increased. As one student put it, "Everyone understands a good deal!"

The best way to get an overview of the curriculum compacting process is to examine an actual example of how the management form that guides this process is used. A completed example of this form, entitled "The Compactor," is presented in Figure 1. The form is both an organizational and record keeping tool. Teachers should fill out one form per student, or one form for a group of students with similar

[Insert Figure 1 About Here]

curricular strengths. Completed Compactors should be kept in students' academic files, and updated on a regular basis. The form can also be used for small groups of

students who are working at approximately the same level (e.g., a reading or math group). The Compactor is divided into three sections:

- o The first column should include information on learning objectives and student strengths in those areas. Teachers should list the objectives for a particular unit of study, followed by data on students' proficiency in those objectives, including test scores, behavioral profiles and past academic records.

- o In the second column, teachers should detail the pretest vehicles they select, along with test results. The pretest instruments can be formal measures, such as pencil and paper tests, or informal measures, such as performance assessments based on observations of class participation and written assignments.

Specificity is extremely important. Recording an overall score of 85 percent on ten objectives, for example, sheds little light on what portion of the material can be compacted, since students might show limited mastery of some objectives and high levels of mastery on others.

- o Column three is used to record information about acceleration or enrichment options. In determining these options, teachers must be fully aware of students' individual interests and learning styles. We have used two instruments to help us make decisions about replacement activities that place major emphasis on student preferences. The *Interest-A-Lyzer* and the *Learning Styles Inventory* (Renzulli and Smith, 1979) provide profiles of general categories of student interests, and the types of learning activities that students would like to use in pursuing these interests.

### **Eileen: A Sample Compactor Form**

Eileen is a fifth grader in a self-contained heterogeneous classroom. Her school, which is very small, is located in a lower socioeconomic urban school district. While Eileen's reading and language scores range between two and five years above grade level, most of her 29 classmates are reading one to two years below grade level. This presented Eileen's teacher with a common problem: What was the best way to instruct Eileen? He agreed to compact her curriculum. Taking the easiest approach possible, he administered all of the appropriate unit tests for the grade level in the Basal Language Arts program, and excused Eileen from completing the activities and worksheets in the units where she showed proficiency (80 percent and above). When Eileen missed one or two questions, the teacher checked for trends in

those items and provided instruction and practice materials to ensure concept mastery.

Eileen usually took part in language arts lessons one or two days a week. The balance of the time she spent with alternative projects, some of which she selected. This strategy spared Eileen up to six or eight hours a week with language arts skills that were simply beneath her level. She joined the class instruction only when her pretests indicated she had not fully acquired the skills or to take part in a discussion that her teacher thought she would enjoy. In the time saved through compacting, Eileen engaged in a number of enrichment activities. First, she spent as many as five hours a week in a resource room for high ability students. This time was usually scheduled during her language arts class, benefiting both Eileen and her teacher, since he didn't have to search for all of the enrichment options himself. The best part of the process for Eileen was she didn't have make-up regular classroom assignments because she was not missing essential work.

Eileen also visited a regional science center with other students who had expressed a high interest and aptitude for science. Science was a second strength area for Eileen, and based on the results of her *Interest-A-Lyzer*, famous women was a special interest. Working closely with her teacher, Eileen chose seven biographies of noted women, most of whom had made contributions in scientific areas. All of the books were extremely challenging and locally available. Three were on an adult level, but Eileen had no trouble reading them. Eileen's Compactor, which covered an entire semester, was updated in January. Her teacher remarked that compacting her curriculum had actually saved him time--time he would have spent correcting papers needlessly assigned! The value of compacting for Eileen also convinced him that he should continue the process. The Compactor was also used as a vehicle for explaining to Eileen's parents how specific modifications were being made to accommodate her advanced language arts achievement level and her interest in science. A copy of the Compactor was also passed on to Eileen's sixth grade teacher, and a conference between the fifth and sixth grade teachers and the resource teacher helped to insure continuity in dealing with Eileen's special needs.

## Summary

Curriculum compacting takes time and energy on the parts of both teachers and students. Yet, over the years, we've discovered that it saves teachers precious hours,

once they're familiar with the process. Most educators who now compact effectively say that it takes no longer than normal teaching practices. More importantly, they tell us that the benefits to all students certainly make the effort worthwhile. One teacher's evaluative comments about the compacting process reflects the attitude of most teachers who participated in our research. "As soon as I saw how enthusiastic and receptive my students were about the compacting process, I began to become more committed to implementing this method in all my classes." Teachers also overwhelmingly indicated that although they had been asked to target one or two students for this study, they were able to use the compacting process with a much broader segment of their students. Many teachers in the study said that as the school year progressed, they had extended compacting to as many as eight or ten students in their classes.

The many changes that are taking place in our schools require all educators to examine a broad range of techniques for providing equitably for all students. Curriculum Compacting is one such process. It is not tied to a specific content area or grade level, nor is it aligned with a particular approach to school or curricular reform. Rather, the process is adaptable to any school configuration or curricular framework, and it is flexible enough to be used within the context of rapidly changing approaches to general education. The research study described above, and practical experience gained through several years of field testing and refining the compacting process have demonstrated that many positive benefits can result from this process for both students and teachers.<sup>2</sup>

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<sup>2</sup> Persons interested in obtaining information about training in Curriculum Compacting should contact the senior author at the National Research Center on the Gifted and Talented, 362 Fairfield Road, The University of Connecticut, Storrs CT 06269.