

Talent Development Through Curriculum Differentiation

By Joseph S. Renzulli and Sally M. Reis

The many changes that are taking place in our schools require all educators to examine a broad range of differentiated teaching techniques for providing equitable instruction for *all* students. Curriculum compacting is one such process. The process is adaptable to any high school schedule or curriculum, and is flexible enough to be used within the context of rapidly changing approaches to general education.

Two afternoons a week, 15-year-old Ricardo works with a mentor at an optometrist's office near his high school in an urban area in Connecticut. There, Ricardo is building a telescope under his mentor's supervision. When he was selected for the mentorship opportunity, Ricardo said, "It feels good, but I was amazed that I got a chance to do this."

Ricardo was not usually considered an outstanding student, and had not been motivated to work at high levels in some of his previous classes. And, research project mentorships were not a standard program opportunity for students like Ricardo, who lives in subsidized housing and whose family manages to survive on a monthly welfare check and food stamps.

But the school Ricardo attends regards talent development in a different way and it seeks to identify a broad range of talent potential in all students through the use of the Schoolwide Enrichment Model (SEM; Renzulli and Reis, 1985; 1997). This model, originally conceived as a program for academically gifted students, is currently used as an enrichment approach to develop the gifts and talents of a much wider pool of students. In some schools, it is used as the basis for providing enrichment opportunities for all students.

One component of the SEM, a student strength assessment guide called the Total Talent Portfolio, helps to focus attention on student interests and learning style preferences as well as strengths in traditional subjects. These content area strengths serve as building blocks for advanced achievement. Ricardo's strongest academic area is mathematics; using a second component of the SEM, a process called curriculum compacting (Renzulli & Smith, 1979; Reis, Burns, & Renzulli, 1992), he is now being provided with differentiated mathematics material above the level being covered in his classroom.

Ricardo, who once described himself as a "mental dropout," now finds school a much more inviting and challenging place. He is hoping to enter the telescope he is building in the state science fair, and is considering a career in engineering. His math teacher has helped him apply for a special summer program at the University of Connecticut designed to recruit and assist minorities interested in mathematical and engineering related professions. His mentor, the

optometrist, has completed a glowing recommendation for his application to this summer program.

Addressing Students' Needs and Talents

The policy statements of almost every school district in the nation reflect a commitment to meeting students' individual needs; and yet, in many secondary school classrooms, teacher, either do not or cannot put these policies into practice. Some teachers can and do make necessary adjustments for lower achieving students, but many do not make comparable adjustment for students like Ricardo who are already achieving at well above average levels.

The reasons many secondary teachers do not make these modifications vary. Some see the need but do not know how to modify content; others do not believe any modifications should be made for high achieving students, or those with high potential who do not achieve. Still others, often overtaxed by large numbers or students with diverse needs in heterogeneous classes, simply cannot find the time to modify content for high achieving students.

This article describes one easy-to-implement instructional technique for modifying the curriculum in the SEM, called curriculum compacting. Curriculum compacting involves three steps:

1. Assessing students' academic strengths
2. Eliminating skillwork and content that students have already mastered
3. Replacing the work that has been eliminated with more challenging alternatives, some of which are based on students' interests.

Curriculum compacting can be used for any student who displays strengths or high levels of interest in one or more content areas, and has been proven effective in recent national research studies (Imbeau, 1991; Reis et al., 1993). It is also widely suggested as a strategy to address the needs of advanced students, and is mentioned in every major textbook and video dealing with gifted education and differentiation.

Challenging Our Able Students

One problem facing schools is an absence of curricular differentiation and academic challenge for some of our most able students. Many students who achieve at average and above average levels demonstrate mastery of the curriculum because contemporary textbooks have been "dumbed down," a phrase used in 1984 by Terrel Bell, then-Secretary of Education. Chall and Conard (1991) concur with Bell's assessment, documenting a trend of decreasing difficulty in the most widely used textbook during the last several decades.

Recent findings by Usiskin (1987) and Flanders (1987) indicate that textbooks have not only decreased in difficulty, but also incorporate a large percentage of repetition to facilitate learning. Usiskin found that only 25 percent 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. For example, eighth grade students who

used these math textbooks encountered only 30 percent of new content in the course of the school year, which equates to learning new material one and one-half days a week, and reviewing previously introduced material the other three and one-half days.

Recent research findings suggest a mismatch between the difficulty of textbooks, the repetition of curricular material in these texts, and the needs of our high achieving and high ability learners. These students may spend much of their time in school practicing skills and studying content they already know.

The use of advanced or honors classes addresses some of these concerns, but advanced classes are not homogeneous in nature. Students differ in levels of ability, achievement, interests, and both the desire to work and the knowledge of how to expend effort in a specific content area.

Research That Offers a Practical Solution

A study completed at the University of Connecticut's National Research Center on the Gifted and Talented (NRC/GT; Reis et al., 1993) examined strategies that teachers can use to modify the curriculum so it accommodates students' individual strengths. The study further examined the kinds of replacement activities used to provide more appropriate levels of curricular challenge. Twenty-seven school districts and 465 teachers participated in the study; the participants ranged from a small rural school in Wyoming to an urban magnet school in California.

Teachers were able to compact approximately 40–50 percent of traditional classroom material for targeted high achieving students in one or more content areas. When teachers eliminated as much as 50 percent of regular curriculum activities and materials for targeted students, no differences were observed in post-test achievement scores between treatment and control groups.

Three categories of replacement strategies were used to provide alternative learning activities for the content that had been eliminated: enrichment, acceleration, and other, which included peer tutoring, cooperative learning, correcting papers, and other teacher assistance tasks. Ninety-five percent of teachers used enrichment opportunities, while 18 percent also used acceleration. Many teachers indicated they would have elected to use acceleration more frequently, but were prevented from doing so by district policies that prohibit content area acceleration.

Although the majority of replacement strategies reflected student interests, needs, and preferences, they did not always reflect the types of advanced content that would be appropriate for high achieving students. This finding indicates that additional staff development is necessary, especially as it relates to appropriately challenging, differentiated replacement strategies.

Using Compacting to Modify and Differentiate Content

The best way to get an overview of the curriculum compacting process is to examine an actual example of how the form that guide this process is used. Examples are provided of how

compacting was used for three secondary students, including the “The Compactor” form, which can be used for both organization and record keeping. The compacting process should be updated on a regular basis, and can also be used for small groups or students who are working at approximately the same level.

The Compactor is divided into three sections:

1. The first column includes information on learning objectives and student strengths in those areas.
2. In the second column, teachers provide assessments of students’ strengths and competencies based on information gathered from variety of sources including observations or class participation and written assignments.
3. Column three is used to record information about differentiated acceleration or enrichment options.

In determining these options, teachers must be aware of students’ interests and learning styles. Regular compacted curriculum work should never be replaced with more advanced material that is solely determined by the teacher. Instead, students’ interests should be actively sought by using the Total Talent Portfolio component of the SEM. A student questionnaire entitled the Interest-A-Lyzer (Renzulli, 1977, 1997) has been widely used and field tested for 20-years and has been recently modified for secondary students. By learning about students’ interests in the compacting and differentiation process, we can make advanced learning more enjoyable. If, for example, a student enjoys working on science fair projects, that option may be used to replace material that has been compacted from the regular curriculum.

We should be careful to monitor the challenge level of the material that is being substituted, as different types of work are required to help students learn to understand the complex nature of effort and challenge. We should ensure that students are not simply replacing the compacted material with simple reading or work that is not more challenging.

Case Studies of Curriculum Compacting

Caitlin

A sophomore who excels in science, Caitlin is particularly interested in biology. Her teacher has found that Caitlin can cover basic concepts in biology three to four times faster than most students, and that she is intensely interested in ecology. In fact Caitlin has indicated her interest in pursuing an ecological examination of an area near the high school.

Caitlin usually reads three or four chapters in the same time her peers read one. Her teacher, Donna Johnson, encouraged her to read her biology textbook at her own pace; she made chapter tests available to Caitlin so she could take a test when she completed each chapter. Occasionally, Johnson would involve Caitlin in the classroom discussions, but usually she encouraged Caitlin to work on her advanced lab work or her independent study in ecology.

Johnson communicated with Caitlin's other teachers to let them know about her independent study. Caitlin's English teacher responded by indicating she would allow Caitlin to use her finding from her ecology study as her term paper. Her English teacher's objectives in assigning the term paper were having students learn the mechanics and form of writing a paper—footnotes, references, formatting—and the skills of note-taking and using primary sources. Caitlin was able to pursue her interests in ecology and fulfill her English teacher's objectives.

Caitlin's biology teacher later indicated that monitoring Caitlin's independent study in ecology was among her most exciting and rewarding teaching experiences. She also was delighted that Caitlin had become so interested in this area of science that she decided to pursue a major in this area in college.

Juanita

Juanita is a freshman in high school who has been an avid reader all her life. She scored in the highest percentile nationally (99 percent) on the Iowa Test of Basic Skills and had already read two of the novels to be covered in ninth-grade English. She was an excellent writer who had published two poems and a short story in a local junior high school literary journal. Juanita never failed to seek additional help on her writing and was an independent worker who often wrote several drafts of the same story. Her use of vocabulary exceeded her peers, as did her mastery of basic mechanics or writing.

Juanita's teacher learned of her motivation and love of writing during the first week of high school when Juanita asked if she would be willing to read a draft of one of her stories and offer critical suggestions. During the first month of school, Juanita's teacher read four of her short stories and a selection of her poems.

Juanita had already read most of the American fiction and nonfiction that was assigned in this class, so an assessment was conducted to determine if she understood the themes and the vocabulary in these works. Her spelling and vocabulary work was selected from the other period novels she had selected to read. She was occasionally asked to participate in class lectures or discussions either to introduce materials she did not know or to discuss more advanced themes or issues. Juanita would often come to class to check in and then leave to spend time in the library working on the alternative assignments listed in column three.

Bill

Bill loved history. His sophomore American history teacher knew him before classes started because Bill had approached him during previous years to borrow textbooks or primary source books about the Civil War. His love for American history in general, and his knowledge and fascination for the Civil War period were well known to the entire history department. His history teacher had never formally tried to do the compacting process before, but Bill provided a good opportunity to field test it with a student who would obviously benefit from it.

INDIVIDUAL EDUCATIONAL PROGRAMMING GUIDE

The Compactor

Prepared by: Joseph S. Renzulli
Linda M. Smith

NAME Caitlin AGE 15 TEACHER(S) D. Johnson Individual Conference Dates And Persons
Participating in Planning of IEP
SCHOOL De Sato High School GRADE 10 PARENT(S) _____

<u>CURRICULUM AREAS TO BE CONSIDERED FOR COMPACTING</u> Provide a brief description of basic material to be covered during this marking period and the assessment information or evidence that suggests the need for compacting.	<u>PROCEDURES FOR COMPACTING BASIC MATERIAL</u> Describe activities that will be used to guarantee proficiency in basic curricular areas.	<u>ACCELERATION AND/OR ENRICHMENT ACTIVITIES</u> Describe activities that will be used to provide advanced level learning experiences in each area of the regular curriculum.
Biology I Terrestrial Ecology—Chapter 2 ESCS text Has no trouble in grasping basic concepts, and can master material 3–4 times faster than most students.	After reading each chapter, Caitlin will take chapter test or teacher-made test of material.	Independent study options: Ecology study of the area north of the football field. Spices diversity of herbs, birds, mammals.
Modern Biology Text First semester's work chapters 1–19	Chapter test and/or teacher-made test to be taken after individual study in area is completed.	Possible study of how local area farming practices have changed basic ecology of area in the last 300 years.
Laboratory Techniques Mastered or will be able to master all necessary skills in a short period of time.	Teacher-directed quiz on lab equipment, uses, and applications to ecology.	Independent laboratory experiments and projects under the guidance of D. Johnson.
	As soon as Caitlin has mastered material for each chapter, she will be excused from class or work on activities described on column three.	

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INDIVIDUAL EDUCATIONAL PROGRAMMING GUIDE

The Compactor

Prepared by: Joseph S. Renzulli
Linda M. Smith

NAME Juanita AGE 14 TEACHER(S) C. Cooper Individual Conference Dates And Persons
Participating in Planning of IEP
SCHOOL Concord High GRADE 9 PARENT(S) _____

<u>CURRICULUM AREAS TO BE CONSIDERED FOR COMPACTING</u> Provide a brief description of basic material to be covered during this marking period and the assessment information or evidence that suggests the need for compacting.	<u>PROCEDURES FOR COMPACTING BASIC MATERIAL</u> Describe activities that will be used to guarantee proficiency in basic curricular areas.	<u>ACCELERATION AND/OR ENRICHMENT ACTIVITIES</u> Describe activities that will be used to provide advanced level learning experiences in each area of the regular curriculum.
1. Vocabulary 2. Mastery of grammar – subordinate and verbal clauses 3. Has mastered mechanics of basic working skills (has published in local literary journal)	1. Give a pretest to determine which vocabulary words student already knows; student studies only words she doesn't know and takes quiz to demonstrate mastery.	1. Juanita can work on individual research on a self-selected topic in American literature during the time the rest of the class spends on vocabulary and grammar.
4. has read two books covered in the English curriculum such as <i>Huckleberry Finn</i> .	2. Use mastery test from Warner's <i>English Grammar</i> review to see if student has mastered grammar skills; individualized practice for problem areas.	2. Juanita can read other books by the author of books she has already read ... another book by Mark Twain.
Achievement Test Scores (ITBS) 99% (national) score in Reading, Vocabulary, Spelling	3. Evaluate writing sample based on books already read such as <i>Huckleberry Finn</i> . Evaluate both for mechanics, organizations, and thesis development. If writing mechanics are mastered, focus on thematic content.	3. Juanita can use the resource library provided by classroom teacher and librarian to focus on historical and biographical material during this literary period.
	4. Make sure student reads and attends class when covering new literature; historical background could be obtained from primary source material.	

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INDIVIDUAL EDUCATIONAL PROGRAMMING GUIDE

The Compactor

Prepared by: Joseph S. Renzulli
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NAME Bill AGE 15 TEACHER(S) Hébert Individual Conference Dates And Persons Participating in Planning of IEP
SCHOOL Canton High School GRADE 10 PARENT(S) Mr. Paul Jordan 9/31 10/25 11/30 12/10

<u>CURRICULUM AREAS TO BE CONSIDERED FOR COMPACTING</u> Provide a brief description of basic material to be covered during this marking period and the assessment information or evidence that suggests the need for compacting.	<u>PROCEDURES FOR COMPACTING BASIC MATERIAL</u> Describe activities that will be used to guarantee proficiency in basic curricular areas.	<u>ACCELERATION AND/OR ENRICHMENT ACTIVITIES</u> Describe activities that will be used to provide advanced level learning experiences in each area of the regular curriculum.
U.S. History – Colonial History of Civil War 1. Reading 3 years above level (Achievement Test Results)	1. Bill took an exam covering chapters 2–15 with a grade of A+. 2. Bill will write an interpretive paper on a self-selected topic.	1. Bill will develop skills in museum research (related to Civil War memorabilia). 2. Bill will develop poll-taking skills and work as a volunteer for a local congressional candidate.
2. Bill's outside reading has allowed him to investigate many texts on history used in college courses. 3. Hobby—collecting Civil War memorabilia 4. Straight A's in Social Studies.	3. Bill will not have to do regular curriculum work related to History.	3. Bill has selected an interest area and will write a research paper on the political debates of 1960 Kennedy vs. Nixon.

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As indicated in column one, Bill is an excellent student. Besides having high achievement test scores, he also has read numerous texts and nonfiction book on American history, received top grades, and collects Civil War memorabilia as a hobby.

Bill took a mid-term exam in September—usually given in January—to determine his knowledge of American history. He scored an A+, and was excused from most discussions and class assignments such as answering the questions at the end of every chapter, outlining each chapter, and doing group work related to concepts he already knew. Instead, he did independent reading, continued his research on Civil War memorabilia, worked in the congressional campaign of a local candidate, and conducted intensive research on the Kennedy/Nixon debates that had been held during the 1960 election. This area had been a special interest area of Bill's teacher, who enjoyed the opportunity to delve into this topic with one of his students. All these alternative learning experiences were made possible because of the willingness of Bill's teacher to assess his knowledge in September.

How to Implement Curriculum Compacting

The first phase of the compacting process is to define the goals and outcomes of a given unit or segment of instruction. Specific goals and outcomes can usually be found in teachers' manuals, curriculum guides, scope-and-sequence charts, and some of the new curricular frameworks emerging in connection with current discussions about standards. Teachers should examine these objectives to determine which ones 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 comparison of the table of contents may provide an overview of new versus repeated material.

A major goal of this phase of the compacting process is to help teachers make individual programming decisions; a larger professional development goal is to help teachers be better analysis of the material they are teaching and better consumers of textbooks and other curricular material.

Identifying Students for Compacting

The second phase of curriculum compacting is to identify 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 identifying which students have already mastered the content or have the potential to master new material at a faster pace. Learning more about individual students is, of course, the best way to begin the assessment process. Scores on previous tests, completed assignments, teachers' assessments from previous year, and participation in other classrooms are commonly used to identify likely candidates for compacting.

A student who is a candidate for compacting has not necessarily already mastered all the regular curriculum objectives. Therefore, the second step of identifying students for compacting consists of finding or developing appropriate assessment techniques to evaluate specific learning outcomes. Essays, projects, other curricular activities, unit pretests, or end-of-unit tests that can be administered as pre-tests can be used to achieve this task. An analysis of the results of these

assessments 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 reinforcement.

The process is slightly different 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 understand the goals and procedures of compacting, including the nature and self-selectivity of the differentiated replacement activities. Teachers should discuss content objectives with the student and specify the procedures for verifying mastery at a high level. These procedures might consist of answering questions based on the chapters, writing an essay, creating a project, or taking a test. The amount of time for completing the unit should be specified, and procedures such as periodic progress reports or log entries for teacher review should be agreed upon. An examination of differentiated acceleration and/or enrichment replacement activities should be a part of this discussion.

Assessment or pretesting of all students in a class when a new unit or topic is introduced can also be used for the compacting process. Although this may seem like more work for the teacher, it provides an opportunity for all students to demonstrate their strengths or previous mastery in a given area. Using a matrix of learning objectives, teachers can analyze the assessment results and establish small, flexible, and often temporary groups for skill instruction and replacement activities.

Differentiated Acceleration and Enrichment Options

The final phase of the compacting process is based on cooperative decision making and creativity on the parts of both teachers and students. Students should be active partners in the compacting and differentiation process through an analysis of their interests and learning preferences.

Our approach to targeting learning characteristics uses both traditional and performance-based assessment to compile information about three dimensions of the learner—abilities, interests, and learning styles. This information, which focuses on strengths rather than deficits, is compiled in a Total Talent Portfolio (TTP) for each student, which is then used to make decisions about talent development opportunities in regular classes, enrichment opportunities, and differentiated curricular replacement opportunities. This approach is consistent with our concept of *developing* gifts and talents (Renzulli, 1994). The TTP includes information about student interests, hobbies, activities completed at home and in school, and after information about individual preferences.

Once a teacher has identified student interests and preferences, differentiated enrichment materials can be gathered from other 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, or a variety of individual and group project-oriented activities designed to promote active 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; and involvement in community service activities.

The time saved should be used by the teacher to provide a variety of differentiated opportunities for the student; these are listed in the third column of the Curriculum Compactor. These strategies might include selected independent investigations, mini-courses, advanced content, mentorships, and alternative reading assignments.

Acceleration might include the use materials from the next unit or chapter, the use of the next chronological grade level textbook, or the completion or even more advanced work. Alternative activities listed in the third column of the Compactor should reflect an appropriate level of challenge and rigor commensurate with the student's abilities and interests.

Decisions about which differentiation strategies to use should be 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 these strategies should be the degree to which they increase academic challenge and the extent to which they meet individual needs. Teachers should select learning experiences that represent individual strengths and interests rather than the assignment of more-of-the-same learning activities.

This aspect of the compacting process should be viewed as a creative opportunity for teachers to work cooperatively to organize and institute a broad array of differentiated curriculum experiences. A mini-course that faculty member has always wanted to teach, or serving as a mentor to one or two students who are interested in a teacher's favorite topic are ways these activities can add excitement to the teachers' part in this process.

We have also observed that when some previously bright but underachieving students realized 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!"

Summary

Curriculum compacting takes time and energy on the parts of both teachers and students. Yet, we have discovered this process can save teachers precious hours, once they are familiar with the process. Most secondary teachers who have learned to compact effectively indicate that it takes no longer than normal teaching practices. More important, they tell us that the benefits to all students make the effort worthwhile. One teacher's evaluation of 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."

In research on this practice (Reis et al., 1993), teachers 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 several students. Many teachers also said that as the school year progressed, they had extended compacting to as many as 8 or 10 students in their class.

The many changes that are taking place in our schools require all educators to examine a broad range of differentiated teaching techniques for providing equitable instruction 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 curriculum development. The process is adaptable to any high school schedule or curricular framework, and is flexible enough to be used within the context of rapidly changing approaches to general education. Both research 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 secondary students and their teachers.

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