

Bridging the Gap: A Tool and Technique to Analyze and Evaluate Gifted Education Curricular Units

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ABSTRACT

Research on the quality of educational standards, our knowledge about the quality of textbooks, and the performance of high-achieving students on international assessments all point to the need for exemplary curricula for gifted and talented young people. The gap between research in these areas and the needs of gifted and talented learners is startlingly clear. This article includes information about the development of a rubric that was originally designed to assess the quality of curricular units that are submitted annually to the National Association for Gifted Children (NAGC) Curriculum Division's Curriculum Competition. The article also includes information about 4 different, but related, uses for the rubric. Ultimately, we hope that the use of this tool and assessment technique by practitioners across the country will begin to close the enormous gap between the learning needs of gifted and talented young people and curricula.

PUTTING THE RESEARCH TO USE

Teachers of the gifted and talented and regular classroom teachers can use the research presented here in a variety of ways. First, the literature review addresses the lack of high quality curricular material for gifted and talented students. This section of the article can be used to justify the need for a gifted and talented teacher who can help classroom teachers increase the challenge level of curricula and instruction. This article also includes information about the evolution of differentiated instruction. Practitioners with a predilection for history may find this chronology of interest.

The rubric that is provided in the article to assess the quality of the Curriculum Division's annual Curriculum Awards Competition can be used by all teachers for four different, but related, purposes. First, the key features and quality indicators of the rubric can be used to support the work of practitioners as they seek to make systematic and cost-effective decisions about purchasing curricular materials. Second, the rubric can be used to evaluate the quality of existing curricular units. Results of the evaluation can be used to improve the quality and alignment among the curricular components in each unit. Third, the rubric can be used by professionals to guide the creation of new curricular units. Finally, the rubric can be used as a precursor to differentiation. When used to ensure the quality of existing curricular units *prior* to the differentiation process, teachers build a solid foundation for the strategies they design to accommodate the unique learning needs of the diverse students in their classrooms.

The need for exemplary curricula for gifted and talented young people is more critical than ever. Indicators of this need emerge from three lines of research and bodies of knowledge: what we know about the quality of educational standards, our growing knowledge about the quality of textbooks, and the performance of our students on international assessments. With this critical need in mind, the purpose of this article is threefold. First, we will briefly explore the indicators that point to the lack of challenge in our nation's curricula for all students, especially our high-achieving students. When the conclusions of these lines of research are juxtaposed with the learning needs of gifted and talented students, the seriousness of the situation is startlingly clear. The second purpose of this article is to share a curriculum assessment technique that was developed by members of the Curriculum Division of the National Association for Gifted Children. The tools and procedures were originally designed to assess the quality of curricular units that are submitted annually to the Curriculum Division's Curriculum Competition. The third purpose of this article is to share four different, but related, purposes for the rubric. Ultimately, we hope that practitioners across the country can use this tool and assessment technique to begin closing the enormous gap between the learning needs of many gifted and talented young people and the regrettably mediocre curricula that are currently available for advanced learners.

The Current State of Curricular Standards in the United States

On January 24, 1992, the National Council on Education Standards and Testing (NCEST) wrote a letter to Congress, the Secretary of Education, the National Education Goals Panel, and the American people. The purpose of the letter was singular: to alert the nation to the low level of American curricula and to spur the nation into adopting national standards. NCEST's final analysis of the nation's curricula was compelling.

In the absence of well-defined and demanding standards, education in the United States has gravitated toward de facto national minimal expectations, with curricula focusing on low-level reading and arithmetic skills, and on small amounts of factual material in other content areas. Many current assessment methods reinforce the emphasis on these low-level skills and processing bits of information rather than on problem solving and critical thinking. (p. i)

Recent research suggests that, while states' standards have improved dramatically since the early 1990s, we still have a long way to go (*Education Week, 2001*). A series of analyses by Achieve, a nonprofit group in Cambridge, Massachusetts, created by governors and business leaders to promote standards-based reform, suggests that,

while standards have become more prevalent, clearer and more specific, many are still vague and all-encompassing. They tend to repeat the same topics from grade to grade and omit some of the more challenging academic content stressed in other high-performing countries. (Education Week, p. 33)

Even though there has been improvement in the quality of states' standards, their current quality does not reflect our best knowledge about curricula for all students, let alone our knowledge about the educational needs of advanced learners.

Recent Conclusions About Textbooks

The council's report and recent research findings about the lack of challenge in educational standards are supported by the conclusions of researchers who have examined the quality of textbooks. Experts and researchers continue to examine the characteristics of selected textbooks and related curricular materials that drive as much as 80-90% of classroom and homework assignments (Jones, 2000).

Tyson-Bernstein (1988) and Chall and Conard (1991) spoke out about the decline of reading textbooks. A. Graham Down, writing in the foreword to Tyson-Bernstein's *A Conspiracy of Good Intentions: America's Textbook Fiasco*, suggested:

The public regards textbooks as authoritative, accurate, and necessary. And teachers rely on them to organize lessons and structure subject matter. But the current system of [reading] textbook adoption has filled our schools with Trojan horses--glossily covered blocks of paper whose words emerge to deaden the minds of our nation's youth, and make them enemies of learning. (p. ii)

Literature textbooks are problematic, too. While many contain noteworthy literary selections, the richness of the selections is subordinated to reading and composition skills, rather than used to understand and appreciate literary elements or genres (Canciolo & VanCamp, 1991). In many cases, the questions at the end of each literary selection evoke only low-level thinking: literal interpretation and factual recall. Little attention is given to the critical literary elements that serve as the foundation for all literature.

Reading and language arts textbooks are not the only curricular materials to have been criticized for over a decade. Steen (1989), Usiskin (1987), and Flanders (1987) have been outspoken about the repetition and decreasing amount of content covered in American mathematics books since the late 1980s. As a result of the continuing lack of quality in American mathematics textbooks, the federal government has stepped into the curriculum debate and has conferred, for the first time ever, its stamp of approval on what it believes to be "exemplary curriculum programs that work": College Preparatory Mathematics Program, a 4-year secondary program; Connected Mathematics, grades 6-8; Core-Plus Mathematics Project, an integrated high school program; Interactive Mathematics Program, an integrated problem -

based high school curriculum; and Pact Algebra, a technology-based program for grades 7-12 (Viadaro, 1999).

Bracey (1993) underscored the earlier work of Sewall (1988) and Gagnon (1988), who spoke clearly about the vast amount of material social studies and history teachers are required to cover in textbooks. Bracey criticized sharply the overemphasis of social studies texts on facts and a practice called "mentioning," which results when textbooks skip or flit from one topic to the next without providing emphasis on critical events or connecting the chronology of historical events in a meaningful way. "Even important topics receive superficial coverage, a practice that blurs the distinction between important and small ideas. The texts provide no context for their facts and few connections between events and activities" (Bracey, p. 654). Most recently, Sewall, now president of the American Textbook Council, observed, "Textbooks [social studies and history] are so badly overstuffed and so diced that they are in places unintelligible" (Manzo, 1999, p. 39).

Researchers and experts increasingly cite the poor quality of science materials (Bradley, 1999). Researchers concluded that middle school science textbooks "covered too many subjects with little depth, didn't develop key ideas well, and included classroom activities that were either irrelevant or failed to help students relate what they were doing to underlying scientific concepts" (Bradley, p. 5).

Similar studies in the area of gifted education underscore the findings of content area experts and researchers (Brandwein, 1981; Kaplan, 1979; Maker, 1982; Passow, 1982; VanTassel-Baska, 1994). VanTassel-Baska (1992) speaks for many curriculum experts in gifted education:

General school curricula are inappropriate for gifted learners....[S]chool curricula organized around the needs of typical learners, with its spiral effect of incremental learning modules with heavy doses of reinforcement around a given skill or concept, is the pattern for basic text materials as well as the dominant mode for classroom instruction. (pp. 25-26)

To summarize, researchers and experts in every area of education tell us that many curricular materials can be characterized as irrelevant to the content area, repetitious, overemphasizing basic level facts instead of underlying principles of a field of study, and lacking in alignment among curricular components.

The Third International Mathematics and Science Study (TIMSS) and TIMSS-R

With low-level educational standards and poor-quality textbooks, it is little wonder that U.S. students fared poorly on recent international assessments of students in grades 4, 8, and 12 (Office of Educational Research and Improvement, 1999). The achievement of our most advanced students, when compared to their counterparts in 16 other countries, was most disturbing. In the advanced mathematics assessment, U.S. students who had taken or were taking pre-calculus, calculus, or Advanced Placement (AP) calculus were compared to advanced mathematics students in other countries. In the physics assessment, U.S. students who had taken physics or were taking physics or AP physics were compared to advanced science students in other countries. The average scores of U.S. physics and advanced mathematics students were below the international average and among the lowest of the 16 countries that administered the physics and advanced mathematics assessments. The U.S. outperformed no other country on either assessment.

In 1999, the TIMSS' sponsoring agency administered the TIMSS-R. The "R" stands for Repeat. The TIMSSR allowed the U.S. to compare the achievement of its eighth graders in the original TIMSS to the achievement of its eighth graders 4 years later. In 1995, U.S. fourth graders bested the international average in both science and mathematics. By the time this group of students reached eighth grade, its performance was mediocre. "Some people thought that fourth graders [in 1995] reflected a new trend," said William Schmidt, head of a TIMSS project that compared the curricula of all the countries that participated in the 1999 study. "This [new information] says this is not true. We don't have a new cohort of high performing kids" (Hoff, 2000, p. 20).

Can we attribute this lackluster performance to the educational context in which mathematics and science instruction occurs? Researchers who conducted the TIMSS study looked at school curricula, instruction,

lessons, textbooks, policy issues, and the lives of teachers and students to understand the educational context in which science and mathematics learning took place. They concluded that the amount of homework, instructional time, and television watching were not strongly related to the performance of U.S. students. Additionally, they ruled out the effect that after school employment might have. They concluded that, although twelfth-grade students are more likely to have jobs, this factor did not appear to be related to the relatively poor performance of U.S. seniors when compared to their international counterparts.

Evidence continues to grow that the middling performance of students on these international assessments may stem from the curriculum. William H. Schmidt, research coordinator for TIMSS and professor of education at Michigan State University, reported,

We've begun to establish that there is a relationship between what children study and what they learn. It sounds silly, but that's something that is hard to establish empirically. Often, we tend to find excuses in a host of peripheral issues-kids watch too much TV or there's not enough homework-but the TIMSS data keep driving us back to the basic issues of schooling. (Viadaro, 1997, p. 6)

Clearly, we must increase the challenge level of curricula for all students, especially students who are advanced learners.

The Educational Needs of Gifted and Talented Students

With mediocre educational standards and uninspiring textbook materials as a backdrop, what do we know about the educational needs of our nation's highest achieving students? Much of the current work in curriculum development for gifted students has been built upon the principles of differentiated curricula that were eloquently stated at the National/State Leadership Training Institute on the Gifted and Talented (Passow, 1982). These experts stated that curricula for the gifted and talented need to be differentiated from the basic curriculum. The content needs to be more in-depth, abstract, complex, and include the study and practice of discipline-specific methodologies. Instruction should include open-ended questions and activities, as well as choices related to learning activities and topics. Instruction should also be flexible with respect to pacing and include opportunities for students, individually and in small groups, to discover patterns, ideas, and new avenues for research. Student products should be authentic, varied, and presented to real-world audiences. Additionally, they should be evaluated according to criteria established by professionals in the field.

Bridging the Gap: A Call for Differentiated Curricula

The gap between the low quality of curricula, as reported by NCEST, textbook analysts, and TIMSS researchers, and the advanced educational needs of our nation's gifted and talented learners is most charitably described as vast. If giftedness, or the behaviors that indicate potential for giftedness, is measured in the response of individuals to stimuli (i.e., the curriculum; Renzulli & Reis, 1985), then we are providing scant stimuli and, unwittingly, limiting the development of potential in many of our nation's most capable young people.

The National Association for Gifted Children (NAGC) has long recognized the enormity of the gap between curricula and instruction and the educational needs of the nation's gifted and talented children. In 1994, the board of directors of NAGC developed a position paper that described the organization's beliefs regarding curriculum differentiation. The paper, published in the June, 1994 issue of *Gifted Child Quarterly*, clarified the official convictions of the organization, underscored the importance of differentiated curricula and instruction for high-achieving students, and defined what is meant by differentiation.

NAGC supports the provision of appropriate quality educational experiences for all students across the spectrum of ability, background, and achievement. The learning needs of gifted students often differ from those of other students and should be addressed through differentiation, a modification of curricula and instruction based on the assessed achievement and interests of individual students.

To provide appropriate and challenging educational experiences for gifted students, differentiation should include acceleration of instruction, in-depth study, a high degree of complexity, advanced content, and variety in content and form (NAGC, 1994, inside back cover).

The NAGC Annual Curriculum Awards Competition

In 1996, the Curriculum and Instruction Division of NAGC proposed that awards be granted to educators who develop outstanding pre-K-12 curricular units. The awards were designed to highlight the importance of curricula and instruction that were designed to meet the varying needs of learners, honor the work of the developers, and promote the development of additional units.

Content Validity

To illuminate the key features of high-quality curricula, a rubric (see Figure 1) was developed to analyze and evaluate the units. To create the rubric, two researchers, who are authors of this article, derived 12 attributes or key features of exemplary curricula from a review of the literature (see Figure 2). Javits and National Association of Education Progress (NAEP) rubrics were included in the review. While the existing rubrics contained some critical key features of curricula and instruction for gifted and talented learners, the authors deemed that no existing rubric contained (1) a comprehensive set of practitioner-oriented key features and (2) descriptors to benchmark increasing levels of quality within each key feature.

For these reasons, the authors developed a 4-point rubric for each of the 12 key features, which are included in Figure 1. This initial set of key features and descriptors was reviewed subsequently for content validity by the remaining authors of this article, as well as six other gifted and talented researchers with advanced degrees and extensive experience in curriculum development. Revisions to the rubric were made according to their suggestions. Descriptors were further refined in each successive year of the award competition.

Interrater Reliability

To ensure interrater reliability, two authors of this study rated sample curricular units. In the first year of the competition, the researchers discussed their results to improve the reliability of their ratings. In each subsequent year, the same researchers assessed each curricular unit and evaluated their ratings using the following formula (Brophy & Good, 1986): Percent Agreement = $1 - (A - B/A + B)$. A and B refer to the ratings by the two raters. The A term is always the largest number. The results of the analyses are listed in Table 1.

The Curriculum Competition Rubric

Key Feature I: Clarity of Objectives

The effectiveness of any curricular unit is built upon strong instructional objectives, statements that describe, in specific terms, what students will know, be able to do, or both. Before any other aspect of a curricular unit can be assessed, these objectives must provide clear direction for the teacher. When objectives are explicitly stated, educators should not have to make assumptions regarding the learning or the desired outcomes. Curricular units with clear objectives receive higher scores than those with vague objectives that require interpretation regarding the learning or student outcomes.

Key Feature II: Nature of the Objectives

Many textbook publishers and school districts categorize learning objectives by subject/topic or grade level. Curriculum developers suggest that we can also categorize objectives by the kinds of learning they require from students. Some curriculum developers propose six categories: facts, concepts, principles, methodologies, attitudes or dispositions, and problem solving (Taba, 1962). Specifically, experts in any content area use facts, concepts, principles, the methodology of a field, the prerequisite dispositions and attitudes, and problem-solving skills to create or elaborate upon the theories that direct inquiry in a field of knowledge.

Facts are specific details. A concept is a broader idea that is a category or class for specific facts. For example, the word tools is a concept that includes specific items or details, such as hammers, washing machines, wrenches, and rulers. A principle is a law or rule that explains a relationship between two or more concepts. "Tools have changed over time to make work more efficient" is a principle that connects four concepts: tools, time, work, and efficiency. **Methodology** refers to the

generic skills associated with content areas (e.g., note taking, comparing and contrasting, formulating a question) or the discipline-specific skills, such as the scientific method in science or conducting oral histories and ethnographies in the social sciences. Using the case mentioned earlier about tools, a related methodology might include how to construct different kinds of building structures: bird houses, dog houses, decks and patios, or home additions. An **attitude is** an appreciation that is key to the domain. In our case, we would want students to appreciate precision, among other things. In architecture, we would want them to appreciate aesthetics. Finally, **problem solving is** the **ability to use** knowledge to solve problems that are not immediately understandable. With respect to the tools scenario, students might be asked to design a new tool to address a real-world problem.

Although it is essential that students understand the facts that pertain to a particular content area, we also know that our most advanced learners must be able to demonstrate that they understand the more abstract, related concepts, principles, methodologies, attitudes, and problem-solving skills. Therefore, this is a critical key feature on the rubric. The instructional objectives must include all kinds of learning, ranging from facts through problem-solving opportunities. Curricular units that contain an appropriate balance among the different types of objectives receive higher scores than those that focus solely on lower level, factual objectives.

Key Feature III: Evaluation Components

The last decade has witnessed a growing recognition of the need for significant changes in educational assessment practices. Traditional assessments may not measure learning outcomes, especially those that result when students apply or transform knowledge or when they monitor and regulate their progress on learning tasks. To measure students' progress toward mastery on advanced level outcomes, new, more effective and accurate assessment models are required. New models include authentic student tasks, such as real-world products and performances, collections of student work, and product-rating scales. Units that include several appropriate measures to assess sophisticated learner outcomes, prior to, during, and at the conclusion of teaching and learning activities receive higher scores than those that do not.

Key Feature IV Learning Activities

Learning activities, which are cognitive experiences that help students perceive, process, rehearse, store, and transfer new knowledge or skills, must provide students with opportunities to become actively involved with the curriculum. Student engagement results when students are learning about topics that hold relevance for them; when they have choices regarding the entry points for learning; and when they are given opportunities to design their own questions, sort through and select appropriate sources, draw their own conclusions, and present their findings in one of several real world products. Learning activities that provide students with these kinds of critical opportunities for learning include small-group discussions, simulations, projects, independent study, and mentorships, among others. Curricular units that embed several of these kinds of learning activities hold high levels of learning power for gifted and talented learners, and these units receive high scores on the rubric.

Key Feature V Instructional Strategies

There are a variety of instructional techniques that methods teachers use to introduce, explain, demonstrate, model, or coach new learning including lecture, drill and recitation, demonstration, modeling, discussion, teaching with analogies, direct instruction, mastery learning, smallgroup work, shared inquiry, Socratic questioning, jurisprudential inquiry, constructivism, projects, simulations, problem-based learning, and teacher as mentor. Gifted and talented learners have high analytic abilities that require the use of instructional techniques that allow them to exercise and refine their analytic powers. Accordingly, curricular units that include a variety of instructional strategies that require students to analyze, synthesize, and evaluate knowledge are rated highly. Award-winning units incorporate teaching strategies such as inductive teaching, Socratic questioning, jurisprudential inquiry, shared inquiry, constructivism, projects, simulations, problem-based learning, and teacher as mentor.

Key Feature VI: Assignments and Student Products

Open-ended and *various* are adjectives that characterize the assignments and products that are beneficial for all learners, especially those who are most capable. Many theorists and researchers also advocate for the use of real world products for these students.

Assignments can be considered on a continuum. At one end of the continuum are assignments that ask for little interpretation by students and involve recall, practice, or convergent thinking. Assignments that require students to practice their basic facts, list the causes of the Civil War, or identify the parts of a plant all demand convergent thinking. At the other end of the continuum are open-ended activities that require students to interpret, reshape, or transpose information. When students are provided with a word problem and asked to explain the different ways it can be solved, they are being asked to think divergently. If students are asked to explain the causes of the Civil War from the point of view of a Northerner and then a Southerner, they are being asked to reshape or infer from historical information. Finally, when they are asked to design a new plant that would be perfectly suited to the tundra, they are being asked to think divergently and transpose information. Assignments that incorporate a variety of opportunities for interpreting and inferring are critical to the needs of our gifted and talented learners. Curricular units that provide these kinds of opportunities for young people are rated higher than those that do not.

Student products must go beyond the traditional written book report to include a variety of other real world forms of communication. Oral products include audiotapes, choral readings, a rap, a gallery talk, and a dramatic dialogue. Visual products include an advertisement, a Web page design, comic strips, a costume design, a greeting card, a set design, and wrapping paper design. Three-dimensional products include an art gallery, a mobile, a model, a museum exhibit, a memorial, a sculpture, stitchery, and a weather instrument. Nontraditional written forms of communication include maps, a picture dictionary, a social action plan, a survey, timelines, and weather logs. Units that incorporate a variety of appropriate real-world products are rated higher than those that include only traditional forms of written reports.

Key Feature VII: Resources

A spectrum of resources, materials that support student learning in the teaching and learning activities, can be tapped for instructional purposes by classroom teachers. The most frequently used resources are textbooks, books, and related articles. Non-print materials are also available and include, for

I. Clarity of Objectives

1. Objectives are not stated.
2. Objectives are discernible, but vague or confusing; assumptions need to be made by the reader.
3. Objectives are reasonably clear; reader is fairly confident he/she understands what students need to know and be able to do.
4. Objectives are clearly stated, specific, and unambiguous.

II. Nature of the Objectives

1. The majority of objectives are concerned with details, basic skills, and factual knowledge.
2. Objectives for learning incorporate major concepts and sophisticated skills within a field of study.
3. Objectives for learning incorporate concepts, principles, cognitive skills, methodologies, and dispositions within a field of study.
4. Objectives for learning incorporate concepts, principles, cognitive skills, methodologies, and dispositions that can be transferred across disciplines.

III. Evaluation Components

1. The student evaluation component is missing or not explicitly stated.
2. The assessment model includes only paper-and-pencil evaluative instruments (i.e., tests, quizzes).
3. The assessment model includes at least two different approaches to evaluation design, including pre-assessment.
4. The assessment model includes at least three different evaluation measures, including pre-assessment. Other assessments may include student portfolios, observational checklists of student behaviors, product evaluation, or self- or peer evaluation.

IV. Learning Activities

1. No student learning activities are described.
2. At least two different types of learning activities are described.

3. At least three different types of student learning activities are described. Many of these involve active engagement or hands-on learning.
4. At least three different types of learning activities are described. The majority of these activities involve constructivist learning, problem solving, cognitive engagement, and/or hands-on learning.

V. Instructional Strategies

1. The instructional strategies are not explicitly stated or described.
2. The instructional strategies are described. Strategies involve direct instruction or self-study.
3. At least two different instructional strategies are described. At least one of these strategies involves inductive teaching, teacher as facilitator, high-level questioning, Socratic questioning, or teacher as mentor.
4. At least three different instructional strategies are described. At least one of these strategies involves inductive teaching, teacher as facilitator, high-level questioning, Socratic questioning, or teacher as mentor.

VI. Assignments and Student Products

1. Fewer than two kinds of student products or assignments are described.
2. The author describes at least three different kinds of student products or assignments. The majority of these assignments involve convergent thinking, recall, or practice.
3. The author describes at least three different kinds of student products or assignments that are embedded in the lesson plans. The majority of these assignments involve open-ended assignments that are subject to personal interpretation or accommodate varying levels of expertise.
4. The author describes at least three different kinds of student products or assignments. The majority of these assignments involve open-ended assignments, the development of creative products, or the development of products related to real-world applications or problem solving. These products are closely aligned with other curricular components.

VII. Resources The unit contains:

1. One, two, or three resources of one type (i.e., texts, books, articles).
2. Five or more varied resources, including print and nonprint materials (i.e., books, videotapes, audiotapes, hands-on materials, software, Internet sources).
3. Five or more varied resources and realia.
4. Five or more varied resources and realia, including-primary source material.

VIII. Alignment of Curricular Components

1. No lesson plans are evident, or fewer than three lesson plans were developed for this curricular unit, or the lesson plans contained fewer than three of the components listed below, or the plans were not explicit enough for other educators to follow.
2. The curricular unit contains more than three lessons. Each lesson describes at least three of the following instructional components: objectives, assessment, introduction, teaching strategies, learning activities, products, and resources.
3. The curricular unit contains more than three lessons. Each lesson describes at least five of the components mentioned above. Most of the components are sequenced and aligned (related to each other).
4. The curricular unit contains more than three lessons. Each lesson describes at least five of the components mentioned above. All the components are sequenced and closely aligned (rely strongly on each other to accomplish the lesson objectives).

IX. Nature of Differentiation

1. No opportunities for differentiation are evident.
2. Some open-ended activities are included in the unit.
3. This unit allows for at least two of the following adjustments: pacing, depth, breadth, level of abstraction, level of complexity, degree of generalizability, talent development.
4. Activities and assignments that accommodate the learning needs of high-achieving students are explicitly described. At least three or more of the adjustments (listed above) are included.

X. Opportunities for Talent Development

1. The unit includes none of the activities listed below.
2. The unit includes at least below.
3. The unit below.

4. The unit below.

- Opportunities for "kid watching" and "talent spotting." one of the activities listed includes at least two of the activities listed includes at least three of the activities listed
- Opportunities for students to engage in some activities aligned with their individual strengths, preferences, or interests.
- Opportunities to foster the connection between unit activities and potential career fields, leadership opportunities, or real-world applications.
- Opportunities to interact with role models, community resources, mentors, or professionals in the field. Opportunities to explore advanced content in that field. Opportunities to acquire the skills, methodologies, and dispositions of the practicing professional in that field.
- Opportunities to investigate real-world problems and to develop authentic products and services in that field.

XI. Evidence of Effectiveness

1. No evidence of effectiveness is provided.
2. The unit has been used at least once with students; anecdotal evidence is included.
3. The unit has been used more than once. Evidence that supports general student growth was gathered and provided.
4. The unit has been taught more than once. Developers describe a systematic effort to assess growth and change in gifted education students.

XII. Ease of Use by Other Educators

1. Vital curricular components are missing.
2. Most curricular components are evident, but some are not described in enough detail to foster ease of use by other educators.
3. Most curricular components are evident.
4. Components are explicit, well-sequenced, and easy to follow. Field-tested suggestions for planning and implementation are included.

Figure 1. National Association for Gifted Children Curriculum Division Rubric for Rating Outstanding Curricular Material.

example, videotapes, audiotapes, pictures, graphs, and maps. Less frequently used resources are realia, that is, objects used to relate classroom teaching to real life, such as photographs, journals, and clothing and accessories, (including hat pins, shoes, purses, buggy blankets, saddles, and the like). A final category of less-used resources is primary source documents. Primary source documents contain first-hand information about an event or a time in history and include letters, journals, authentic photographs, historic maps, supply lists, ledgers, and ship's manifests. A wide variety of resources is essential in an exemplary curriculum. Additionally, realia and primary source documents are critical for our gifted and talented learners because they provide high-achieving young people with critical, "ceilingless" opportunities to analyze and interpret information. Award-Winning units incorporate all the kinds of resources mentioned here.

Key Feature VIII: Alignment Among the Curricular Components

Alignment refers to the cohesion among the components of a curricular unit. Specifically, the objectives, introduction, teaching strategies, learning activities, products, resources, and assessments must work together effectively; each lesson component reinforces the others in a way that the unit becomes greater than any of the individual parts. The strength of the cohesion among the components increases the likelihood that students will accomplish the intended lesson objectives. Award-winning curricular units contain more than three lessons. Furthermore, superior units include at least five of the components listed above, and all components build upon each other to accomplish the lesson objective(s).

Key Feature	Theorist/Researcher
I. Clarity of Objectives	Bloom, 1956; Gronlund, 1995; Kendall & Marzano, 1997; Mager, 1997; Perkins, 1995

II. Nature of Objectives

- Objectives are organized around the concepts and principles of a discipline

Adler, 1952; Bloom, 1956; Bruner, 1960; English, 1992; Erickson, 1999; Gronlund, 1995; Mager, 1997; Meeker, 1969; Kendall & Marzano, 1997; Marzano, Pickering & McTighe, 1993; Phenix, 1964; Taba, 1962; Ward, 1961; Wiggins & McTighe, 1998

III. Evaluation

2000; (Assessments of Student Work)

Ann Arbor Public Schools, 1993; Burke, 1994; Marzano, Wiggins & McTighe, 1998

IV. Learning Activities

- Learning activities involve Gallagher & constructivist learning, problem solving, and hands-on activities

Brooks & Brooks, 1999; Bruner, 1968; Dewey, 1938; Stepien, 1996; Gardner, 1991; Montessori, 1926; Piaget, 1963; Stepien & Gallagher, 1993; Taba, 1966; VanTassel-Baska, 1992

V. Instructional Strategies

- Inductive teaching, Socratic questioning, teacher as mentor

Brophy & Good, 1986; Joyce & Weil, 1995; Piaget, 1963; Taba, 1962, 1966; Tyler, 1961

VI. Student Products and Assignments

- Open-ended activities and assignments
- Real-world products

Bloom, 1956; Hertzog, 1998; Maker, 1982; Maker & Neilson, 1995; Renzulli, 1982; Taba, 1966

VII. Resources

Ankeney, Del Rio, Nash, & Vigilante, 1996; Deitch, 1996, 1998; National Archives and Records Administration, 1989; Steffey & Hood, 1994

VIII. Alignment

English, 1992; Hunter, 1964

IX. Nature of Differentiation

- Adjustments in pacing, depth, of abstraction, level of complexity, degree of generalizability

Barbe & Renzulli, 1981; Betts, 1985; Bruner, 1985; Davis & level Rimm, 1989; Hollingsworth, 1926; Montessori, 1926; Passow, 1982; Reis, Burns, & Renzulli, 1992; Renzulli, 1982, 1994; Stanley & Benbow, 1982; Taba, 1966; Tomlinson, 1998; Vygotsky, 1978; Ward, 1961

X. Opportunity for Talent Development

- Opportunities for students to engage in activities that are aligned with their individual strengths, learning style preferences, and interests
- Opportunities to explore advanced content

Barbe & Renzulli, 1981; Bloom, 1956; Bruner, 1960; Dewey, 1938; Passow, 1982; Phenix, 1964; Piirto, 1998; Renzulli, 1977; Stanley & Benbow, 1982

- Opportunities to acquire the skills, methodologies, and dispositions of the practicing professional

XI. Evidence of Effectiveness

Cawelti, 1995; Friedman & Fisher, 1998; Wang, Haertel L~Walberg, 1995

XII. Ease of Use

Universal knowledge

Figure 2. Theoretical Foundation for the Curriculum Award Rubric

Key Feature IX: Nature of Differentiation

(Differentiation is composed of techniques and strategies used by the teacher to increase the match between the curriculum and the unique learning needs of students, e.g., interests, motivation, multiculturalism, prior knowledge, cognitive ability)

Often, teachers begin differentiating the curriculum by using open-ended questions, learning activities, or homework. The principle underlying open-endedness is that no single predetermined answer or solution exists. Put another way, open-ended curricular components require that students interpret their answer, assignment, or activity. For example, an art teacher might ask his fifth grade students to compare the French and American Impressionists to uncover the influence that the French Impressionists had on their American counterparts. Open-ended activities are critically important for gifted and talented students because they are "ceilingless"; students are free to take their ideas in any direction and pursue them as far as they would like.

Teachers who are more experienced with differentiation may go beyond open-ended activities and assignments. They make purposeful adjustments in the pacing, depth, breadth, level of abstraction (i.e., ideas that have a wide range of applicability), or level of complexity (i.e., the number of concepts or disciplines that are included in the unit). These adjustments, made to accommodate students' interests, cognitive ability, or prior knowledge are essential considerations for high-achieving young people. Curricular units that include three or more of the adjustments listed above are rated higher than those that include fewer adjustments or just open-ended activities or assignments.

Key Feature X: Opportunities for Talent Development

Talent development consists of two teaching behaviors: *identifying* students' learning and performance assets and *nurturing* students' identified assets within the school and community environment. Curricular units can be designed to enhance the likelihood that talents will be spotted and nurtured. Curricular units that address talent development explicitly using three or more of the strategies listed on the rubric receive higher ratings than those that do not.

Table 1
Interrater Percent Agreement From Ratings of Curricular Units, 1997-1999

Unit	Rater 1	Rater 2	% Agreement
1997			
#1	41	41	100

#2	44	44	100
#3	43	43	100
#4	42	44.5	97
#5	33	33.5	92.5
#6	41.5	41.5	100

1997 Mean Interrater Agreement =
98.25%

1998

#1	46	46	100
#2	46	46	100
#3	47	47	100
#4	43	44	99
#5	42	43	99
#6	43	43	100

1998 Mean Interrater Agreement =
99.60%

1999

# 1	46	47	99.90
#2	38	38.5	99.94
#3	40	40.5	99.94
#4	38.5	39.5	98.72
#5	43	43.5	99.95
#6	42	43	98.83
#7	39	42	96.30
#8	44.5	45.5	98.89
#9	45	45	100
#10	46	46	100

1999 Mean Interrater Agreement = 99.24%

Key Feature XI: Evidence of Effectiveness

The developers of high-caliber curricular units for gifted and talented students have made systematic efforts to measure the effectiveness of their work, that is student growth associated with the use of the curriculum unit. Systematic efforts can be rated on a continuum ranging from "no evidence collected" at one end of the scale to "systematic evidence collected" at the other end. Systematic evidence means that developers have taught the unit more than once, created a research-based procedure to assess student growth or change over time, and documented noteworthy changes in gifted students that can be associated with the curricular unit.

Table 2
NAGC Curriculum Competition Award Winners, 1996-2000*

	Pre K-3	4-8	9-12
1997	<i>Differentiated and Integrated Kindergarten Curriculum</i> Shauna Maughm	<i>Acid, Acid Everywhere</i> Linda Neal Boyce, Sandra Coleman, Victoria Damiani, Shelagh Gallagher, Dana Johnson, Donna Poland, Beverly Sher, & Joyce VanTassel-Baska	<i>Lessons on the Like: An Educator's Guide to the Pontchartrain Basin</i> Mary Banbury, Sharon Flanagan, Michael Green, Sue Ellen Lyons, & Ann Rheams
	<i>Facilitating Inquiry at University Primary School</i> Marjory Cline & Nancy Hertzog	<i>Autobiographies: Personal Odysseys of Change</i> Claire Hughes & Joyce VanTassel-Baska	<i>Architectural Visions</i> Fayetteville (Arkansas) Public Schools
1998		<i>Storm King</i> Laura Shapiro & Terry Murray	
	<i>Journeys and Destinations</i> Catherine Little & Joyce VanTassel-Baska <i>Robots Are Coming</i> Chris Nobbe	<i>Think Like a Sociologist</i> Judy Satterwhite & Chris Briggs <i>Chemistry Magazine</i> Leslie Mirman & Jonathan Plucker	<i>Young Inventors</i> Jonathan Plucker
1999	<i>Think and Talk</i> Kaye Kraus, Donna Morrison, Joyce Armstrong & Katheryn Shannon <i>Riding flit Economic Railway</i> Melody Key & Debbie Bull	<i>Anne of Green Gables</i> Dana Hyrkas & Anne Robinson <i>Who Is American?</i> Sally Simon <i>Across the Generations</i> Chris Briggs & Carol Williams	
1999 cont.	<i>In-Depth Inquiries into the Natural Environment</i> Nancy Hertzog, Marjories Klein & Joyln Blank <i>What a Find</i> Joyce VanTassel-Baska	<i>Walleet Wisdom and Free Enterprise</i> Jo Vanderspiken <i>Food for Thought</i> Gloria Jones, Donna Ncsbitt, Betty Bell, Connie Foster & Nancy Kramer	<i>Visions & Voices</i> Kay Brimijoinm & Cynthia Kelly
2000	<i>Archeology</i> Stephanie Zenker, Carmela Kuper, Carole McKee, Donna Muth,	<i>Discovering History</i> Andi Stix & Frank Hrbek	<i>Gateways</i> Shelagh Gallagher

	Bonnie Kuncel & George Brauer		
	<i>Greek Mythology</i> Jane Cooke, Patricia Shultz & Barbara O'Neill.	<i>Discovering the Oregon Trail</i> Christine Deitz & Ann Robinson	<i>Heroes</i> Robert Covel
	<i>Keeping the Memory Alive</i> Donna Nesbitt, Gloria Jones, Connie Foster & Betty Bell	<i>Literary Reflections</i> Catherine Little & Joyce VanTassel- Baska	
	<i>Return to the Moon</i> Chris Nobbe, Cheryl Spencer & Amy Jones		

*Note. * Shaded areas contain the names of units that were created for gifted Learners; unshaded areas contain the names of units that were created for all learners*

Key Feature XII: Ease of Use by Other Educators

Award-winning curricular units for students must be easy for other educators to use. Easy-to-use refers to two attributes: the number of curricular components that are described in the unit and the clarity of the suggestions for implementing the unit in other classroom settings. Curricular components must be explicit, well-sequenced, and easy to follow to receive a high rating. Additionally, highly rated units contain practical, field-tested suggestions for implementation to assist other teachers in using the unit in their classrooms.

Additional Uses for the NAGC Curriculum Rubric

Earlier in this article, we mentioned that the NAGC Curriculum Rating Rubric was originally designed in 1996 to support an annual curriculum competition. In the last 4 years, it has been used to identify more than 30 outstanding curricular units for high-achieving students (see Table 2). In recent years, we have used the rubric for four additional, but related, purposes.

Curriculum Adoption

First, we discovered that, regardless of its merits as a competition tool, the NAGC rubric is an extremely useful device for gifted education specialists who must evaluate, choose, or purchase replacement lessons, enrichment activities, accelerated units, or supplementary materials for use in gifted education programs or general education classrooms. Publishers and clearinghouses inundate teachers with glossy brochures, empty promises, and slick slogans to sway purchasing decisions. Instead of relying solely on advertisements, unwarranted publishers' claims, or colleagues' opinions, the use of the rubric during the curricular review or adoption process ensures the systematic analysis and evaluation of the vital facets and components of any set of commercial materials. Specific categories or criteria from the rubric can be used to support a purchasing, adoption, or implementation decision that otherwise could result in a costly error in judgment.

Curricular Remodeling

Second, many gifted education specialists use the rubric and its criteria to analyze, evaluate, and improve the quality of the lessons and curricular units that are already in use in their classrooms and gifted education programs. Renzulli (1994) dubbed a similar curricular analysis, evaluation, and improvement process "Textbook Triage." As the name implies, textbook triage mirrors the medical triage procedure used by emergency personnel to categorize patients into one of three categories: those individuals who are not likely to survive despite all medical interventions; those patients who require medical treatment from outside the immediate environment or supplementary sources; and those patients who can successfully be treated using available resources.

In the case of curriculum triage, the "patient" is a curricular unit or a lesson, not a human being. Like medical triage, the curriculum triage process requires a methodical and systematic examination of lessons or units. Practitioners complete the examination by analyzing and evaluating the "vital signs" of curriculum units in the same way that medical personnel examine the pulse, respiration, or blood pressure of a human patient. Vital signs for curriculum triage include the learning objectives, the introduction, learning and teaching activities, and the related resources, products, and assessments. A lower rating for a given component indicates a greater need for revision, while a higher rating suggests that the component is satisfactory and does not need to be revised. Used systematically, the NAGC rubric can help educators decide which curricular components are healthy and which are ailing. Those that are judged to be less than satisfactory become the subject of future revision and remodeling.

For example, if the triage process for a given lesson indicates that the learning objective, the introductory activities, the student products, and the assessment methods are satisfactory or exemplary, but that the teaching activities and the learning resources are of poor quality, then revision is recommended for only the latter two components. The NAGC rubric aids this process in two ways. First, the rubric provides the criteria and justification for rating some components as poor and others as exemplary. The rubric also illuminates the proper direction for follow-up revisions and enhancement decisions. Field trials indicate that remodeled lessons have greater alignment among the components, are set in more real-world contexts, and contain more challenging learning opportunities for students.

Curriculum Development

Although some educators prefer to remodel existing lessons, others are more interested in creating and developing their own lessons and curricular units. Several gifted education specialists who work as support staff and instructional specialists report the use of the rubric's criteria as benchmarks for helping colleagues create and develop their own high-quality, challenging, and original curricular units for use in gifted or general education classes.

Using curriculum planning templates (available upon request from the authors), educators sequentially build a unit and then a set of related lessons, all of which contain common components (e.g., learning objective, introductory activities, teaching and learning activities, resources, products, and assessments). The templates provide a framework for concisely describing the characteristics of each lesson component, and the rubric provides a self-reflection tool to check the quality of the newly designed components. The use of the rubric quickly reveals trouble spots in some facets of the newly created lessons. For example, crucial, but missing elements of an introduction may become apparent. Teaching activities that initially seemed appropriate may appear didactic. Initial ideas that resulted in the development of passive or rote learning activities might be abandoned in favor of more hands-on, minds-on, or constructivist assignments. Primary resources and raw data may replace traditional secondary sources. Student products may become more authentic and more creative than those in traditional units of instruction. Lastly, assessments become more aligned with the learning goal and more authentic and have greater depth, permitting a broader perspective for evaluating pre- to postinstructional learning gains.

A Precursor to Curriculum Differentiation

Some gifted education specialists work collaboratively with practitioners to develop and implement differentiated lessons for classrooms. In these cases, the gifted and talented teacher can use the instrument as a precursor to the development of differentiated lesson plans.

Most differentiated lesson plans develop and extend from the framework of a traditional, whole-class, large-group lesson plan. If the components of the original large-group lesson are poorly aligned, if the grade-level objective is an activity or a resource in disguise, if the grade-level objective is unclear or vague, or if the assessment is faulty or missing, it becomes much harder to create a powerful and effective set of alternatives or differentiated components. Instead, the subsequent differentiated activities, assignments, and resources look more like window dressing than new windows on learning. It is no wonder that, in these situations, educators report little or no growth in student learning as a result of the differentiated lesson plan. If implemented or planned poorly, differentiation can cause negligible or negative results.

To ensure that they are beginning with a high-quality lesson plan, gifted education specialists can use the NAGC rubric to strengthen existing lessons. As such, the NAGC rubric helps to ensure that the differentiation "cart" is not placed before the curriculum remodeling "horse." The rubric helps to strengthen the clarity, alignment, and authenticity of a whole-class lesson or unit before

any intervention or support for the development of differentiated lesson plans. This two-part approach consistently increases the power and effectiveness of the subsequent differentiated lessons or flexible small-group learning activities.

Conclusion

To conclude, the gap between current curricular units and the learning needs of gifted and talented learners is immense. As the gap gets wider, the learning needs of our highest achieving young people become more critical. This gap is a "call to action" for all who are in the field of gifted education. The authors believe the NAGC rubric can be used to bridge the gap between existing curricula and learning units that are powerful, aligned, engaging, authentic, and challenging. Specifically, the rubric can be used to: (1) guide the curriculum adoption process, (2) pinpoint where existing curricular units need remodeling and guide teachers through the remodeling process, (3) scaffold the curriculum development process, and (4) ensure that the differentiation process is built upon high-quality learning units. We anticipate and encourage additional experimentation with and uses for the rubric, and we welcome suggestions for additions or revisions in the original design.

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