TAMS steered me toward my goal of setting up self-sustaining clinics to improve health around the globe. Through the College of Business and the UNT community, I was able to donate more than $3,000 in medical supplies to a clinic in Venezuela and explore my interest in medicine there.”

— ALBERTO HIM
TAMS STUDENT AND
CEO, EVERCARE MEDICAL FOUNDATION

UNT’s Texas Academy of Mathematics and Science — the nation’s first residential program for gifted teens to complete their first two years of college while earning high school diplomas — launches research careers for exceptionally talented students.

tams.unt.edu
The TExas Association for the Gifted & Talented (TAGT) is a nonprofit organization of parents and educators promoting appropriate education for gifted and talented students in the state of Texas. TEMPO is the official journal of the Texas Association for the Gifted & Talented. It is published quarterly. The subscription is a benefit for TAGT members.

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FROM THE EDITOR

by Krystal Goree, Ph.D.

Dear TAGT Members,

The TEMPO Editorial Board would like to extend a personal invitation to you! We invite you to share your ideas for best practice, tips that will help teachers and parents, and examples of the excellent work of your gifted students in TEMPO!

ARTICLES

Some of the best ideas we get for effective teaching and parenting come from our friends, colleagues, and neighbors. Don’t keep those great ideas to yourself! Do you use teaching strategies in your classroom that engage students in higher level thinking, encourage them to create professional-level products and performances, or address their affective needs? As a parent, have you learned ways to help your child deal with perfectionism, discovered positive approaches to take in collaborating with teachers to ensure that your child is challenged in the classroom, or found resources to help your child choose an institution of higher education that is a good fit? If so, do not be bashful! And, these are just a few questions to get you thinking.

Articles submitted to TEMPO do not have to be lengthy, and you do not need to be an expert or renowned researcher in the field of gifted education to submit an article. You will find Writers Guidelines on page 35 of this issue of TEMPO. On the same page, you will also find a listing of upcoming issue themes. The themes are included to give readers an idea of topics that will be addressed in upcoming issues. This does not mean that articles addressing themes other than those listed will not be considered for publication. Just sharpen your pencil or charge your laptop and start writing.

In addition to articles, there are other ways that you can contribute to TEMPO. We have recently added two new columns to the journal that offer even more opportunities for you to share!

STUDENT SPOTLIGHT

Young budding and accomplished artists, poets, musicians, and humanitarians are in our midst, and TEMPO is the perfect place to showcase their talents and accomplishments in the Student Spotlight column. Lacy Compton, an Editorial Board Member, is waiting for you to send information about gifted young Texans and their work to her. She can be reached at lacy@cmptn.com. See page 15 in this issue of TEMPO to get a glimpse of the accomplishments of a group of talented young women who wanted to make a difference. This group is just one shining example of myriad bright, young talent in our great State!

TIPS FOR TEACHERS

Educators are some of the most ingenious and dedicated individuals around. If you are a teacher or administrator who has discovered strategies for organization, instruction, assessment, collaboration, or technology, let others know about them! By sharing tips and ideas with one another, we can become more effective and efficient. Raine Maggio and Dr. Joyce Miller welcome your ideas and look forward to sharing them with others through the new column, Tips for Teachers. Technology is the focus of the column in this issue of TEMPO as ideas for using Kahoot! and Google Technology are presented on page 24. Please send your Tips for Teachers to me, at Krystal_Goree@baylor.edu, and I will pass them on to our column editors.

Advocating for gifted students can sometimes feel like a lonely journey. In many cases campuses (and even districts) have few educators to champion gifted kids. We can join hands and hearts through TAGT! Even if you feel like you are walking solo, know that you are not! There are many educators and parents who share your passion for ensuring that gifted students receive the educational and emotional support they need and deserve. TEMPO is one way that we, as advocates for gifted students, can support and learn from one another. Consider sharing your ideas, successes, celebrations, and the work of your students by contributing to TEMPO! We look forward to hearing from you!

With warm regards and best wishes,

—Krys
According to Popham (2014), educators live in interesting times in relation to educational assessment. After several decades of national and state accountability focused on annual tests built on federal or state standards, assessment permeates curriculum and instruction in most schools. The recent redesign of Texas teacher evaluation places a greater emphasis on holding teachers accountable for their students’ test scores. In the last Texas legislative session, House Bill 5 called for reports of annual evaluation of school programs, including gifted and talented programs. TAGT actually proved instrumental in assuring that gifted and talented programs were included in the programs that must report results from annual evaluations each year.

Assessment and evaluation permeates educators’ lives, both personally and professionally. Either formally or informally, we constantly assess the world around us. Whether assessing the environment, trying to determine the best buy, or selecting the best person to fill an open position, individuals use specific criteria and processes to make the best decision. If the temperature in the room seems too cold, we begin by noticing behaviors and physical characteristics that exhibit a chilly environment. Then, we ask those around us if they feel cold, measuring our assessment against others to develop a consensus before adjusting the thermostat. Purchasing a new car requires several types of assessment. Using prior knowledge, shoppers compare various brands and models to past experience with those products. Consulting other assessment results, consumers review reports related to product specifications, durability, and gas mileage. Gathering input from others, they ask about others’ experience with the particular model and their evaluation of the characteristics of the car. Then, they take a test drive to determine if the car provides a good feel and fit. In a similar way, employers assess the expertise, knowledge, skills, and personality of each applicant to determine the best candidate for a particular position. Using assessment strategies that include review of prior work experience, consultation with references, interview of the candidate, and administration of a strengths test, a committee attempts to match the best applicant to the particular job description.

In the same way, assessment and evaluation drive gifted programs. Beginning with the nomination of gifted children for screening and identification, educators rely on prior knowledge of definitions and characteristics of gifted learners as they consider gifted potential in their students. Districts use a variety of tests, surveys, portfolios, and interviews to determine the best educational fit for gifted learners. Throughout the school year, teachers formally and informally assess educational experiences of gifted students to determine students’ knowledge of content, skills, thinking processes, products, learning styles, and social/emotional needs. Various assessment instruments, including Texas Performance Standard Program (TPSP), Advanced Placement (AP), and International Baccalaureate (IB) tests, allow districts to ultimately assess student learning and determine program effectiveness. Although the Texas State Plan for the Education of Gifted/Talented Students (TEA, 2009) requires schools and districts to evaluate programs annually, House Bill 5 reinforces that requirement by requiring an annual report of assessment. TAGT created a sample evaluation tool and collected several samples from Texas districts that are provided on the TAGT website to assist districts in this process.

The development of robust assessment instruments, evaluation tools, and processes supports effective curriculum, instruction, and programming for gifted and talented children and adolescents. As opposed to the test-driven curriculum that often results from state and national accountability, gifted programs should use assessment and evaluation to authentically assess gifted students’ abilities and learning experiences as well as the gifted program’s design and delivery. Rather than merely ensuring that all students meet minimal standards, this process will guarantee that schools will hold themselves accountable for helping gifted learners reach their full potential as they look for alternative methods to determine students’ growth over longer periods of time (Popham, 2014).

REFERENCES


Promoting Excellence and Continuous Progress With Products

Tracy Ford Inman, Ed.D.
& Julia Link Roberts, Ed.D.
Advocates give speeches encouraging listeners to action, while architects create blueprints that guide construction of new buildings. Almost every professional in today’s world creates products that communicate specific ideas to specific audiences whether that be in the form of a scientific article, a Prezi, or a vodcast. But in the world of P–12 education, students are often resigned to pen-and-paper avenues to show educators what they have learned. Very few professionals are called upon in real life to use multiple choice and true-false measures to communicate ideas. Why then, do educators steer away from authentic products when planning formative and summative assessments?

Reasons why educators hesitate to offer a variety of authentic products for assessment are straightforward: educators do not have time to create new rubrics for each product, nor do they necessarily have the expertise to know what makes a product authentic and exemplary (i.e., What does a professional engineer really look for in a model or a software company seek in a computer program?). An English teacher may feel very comfortable grading essays, poetry, or reports; but he may shy away from a dance, monologue, or mask because he does not really know what the components of a dance are or what makes a mask professional in quality. As far as differentiating products or the assessment of products, most educators fear inequity in grading or being unfair since all students are not required to complete the same assignment.

What are products, and why are they important to the learning experience? Products are simply “vehicles for communicating information and/or demonstrating skills for specific purposes to authentic audiences” (Roberts & Inman, 2015a, p. 2). They are engaging for students to plan and complete. Products motivate students to learn since products are varied in type (such as technological or visual). Students are interested in various types of products, often finding one kind more appealing to create than others. They are a practical way for teachers to match learning experiences to students’ strengths and preferred ways of learning, yet they also provide ongoing opportunities to build new skills and develop new areas of interest. Products encourage creativity, self-expression, high-level thinking, and problem-solving skills. Additionally, products provide teachers with options for differentiating learning experiences based on student experience with the product, level of readiness with the content, and interest in both the content and the product choice.

The Developing (D) and Assessing (A) Product (P) Tool (Roberts & Inman, 2015a, 2015b) is a protocol that may well be the answer to teachers’ concerns. DAP Tools guide students as they develop a product and teachers as they assess the product. As a protocol, the DAP Tool eliminates the need to design a rubric or multiple rubrics with each new assignment. The DAP Tool can be used across grade levels and in all content areas, saving valuable planning time for the teacher. It also makes it easy for teachers to accommodate students who suggest a different product from the product choices assigned since the DAP Tool is ready to use for a variety of products. The DAP Tool simplifies both product differentiation and assessment differentiation.

**INNOVATIONS OF THE DAP TOOL**

The DAP Tool differs from other rubrics in three innovative ways: the standard components, the grading scale, and the tiering system. Each warrants a bit more discussion; but, before dissecting its parts, first consider Figure 1, which shows a sample DAP Tool (i.e., Poster) to get a frame of reference.

... products provide teachers with options for differentiating learning experiences based on student experience with the product, level of readiness with the content, and interest in both the content and the product choice.

### Consistent Components

The DAP Tool sets expectations for students creating products, as all DAP Tools include the same four components—content, presentation, creativity, and reflection. The wording for content, creativity, and reflection remain the same for all DAP Tools, and general language is used so that the criteria apply to all content areas across all grade levels. Presentation is the only component that differs.

**Content.** The DAP Tool utilizes products to gauge student learning whether the educator is using assessment for learning (formative assessment) or assessment of learning (summative assessment). Content, then, is always the first component. The key considerations guiding students as they develop the content for any product include accuracy, organization, and level of understanding. Is the content accurate? Is it well organized? Has it been thought about in a way that goes beyond a surface understanding? Note the lack of specificity to content. This
general wording can apply to a high school student explaining the causes of the Russian Revolution, the middle school student extrapolating on the parts of the cell, or the fourth grader advocating for an increased allowance in a persuasive writing assignment. It is up to the educator to specify the expectations in the actual assignment, which should be distributed alongside the DAP Tool.

Presentation. Presentation is the second of the four components of a DAP Tool, and the only one that changes. The expected aspects or characteristics inherent in a specific product differ from product to product, so the DAP Tool must mirror the product-specific language. For example, as noted in Figure 1, students developing a poster should consider text, graphics, layout, and correctness when designing their product. Students creating a Prezi, however, must attend to the text, multimedia, canvases, delivery, and correctness, while a sculpture should include key elements such as concept, craftsmanship, and elements of design. The guiding characteristics for an essay are structure, elaboration, support, style, and correctness. The presentation portion of the DAP Tool is customized to explain the criteria...
of the product itself letting the student realize not only what constitutes a poster (or blog or …) but also what is necessary to create an exemplary poster (or blog or…).

Creativity. The third component of a DAP Tool is creativity, and just like content and reflection, stays consistent with each DAP Tool regardless of the product. The need to highlight creativity is great for the individual as well as for the good of society:

The world depends on creative people for contributions in all areas of life, from technology, travel, and medicine, to movies, music, and literature. If that were not reason enough, the most compelling motive for our attention is that we are committed to enabling individuals to live fulfilled lives. Parents and teachers need to know that they have a powerful influence on the development of creativity. (Robinson, Shore, & Enersen, 2007, p. 77)

When developing a product, creativity can be shown by how students view and develop the content as well as by how they approach and create the product itself. Therefore, questions in this component are twofold: Is the content seen in a new way? Is the presentation done in a new way? Originality and innovation prove key for this component.

Reflection. The fourth and final component of all DAP Tools is reflection, the metacognitive piece of the DAP Tool. Metacognition allows students to think about their learning in the process of developing the product and completing the learning experience. The goal is to make thinking about one’s thinking a habit that promotes learning related to a single learning experience as well as throughout one’s lifetime. Questions relate to:

- content (i.e., What connections can you make between what you have learned by completing this project and previous learning?),
- product (i.e., In what ways could you improve your product when completing this product with a different assignment?), and
- learning (i.e., How did the amount of effort you put into the development of the product affect your learning about the content and creating the product?).

Rating Scale

A second innovation of the DAP Tool is the rating scale itself; it removes the learning ceiling that can be so detrimental, especially to learners with gifts and talents. The seven-level scale includes two levels past proficiency, sending the critical message that improvement is always possible—and necessary for learners to be globally competitive. Figure 2 outlines the levels and their meanings. The word standard (in five of the seven tiers) must be defined before using the DAP Tool, and that definition must be shared with students so that they understand the goal. It is also important that students understand the meaning of professional level. Rarely, if ever, will students create A-level work by only meeting the basic requirements for the grade.

Tiers

In addition to the rating scale that removes the learning ceiling and the four consistent components, DAP Tools also include three distinct tiers for every product. These tiers become hierarchically more sophisticated both in wording and expectation as is noted in Figure 3. Expectations for content progress from being thought about in a way that goes beyond the surface (i.e., Tier 1) to having depth and complexity of thought (i.e., Tier 2) to showing complex understanding and manipulation of content and deep probing of the content (i.e., Tier 3). A student who has very little experience with content (as determined by

<table>
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<tr>
<th>Tier</th>
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<tr>
<td>0</td>
<td>NONPARTICIPATING LEVEL</td>
<td>Level indicates nothing turned in</td>
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<td>1</td>
<td>NOVICE LEVEL</td>
<td>Level demonstrates initial awareness and knowledge of standard</td>
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<td>2</td>
<td>PROGRESSING LEVEL</td>
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<td>PROFICIENT LEVEL</td>
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<td>ADVANCED LEVEL</td>
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<td>PROFESSIONAL LEVEL</td>
<td>Level expected for meeting the standard</td>
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<tr>
<td>6</td>
<td>PROFESSIONAL LEVEL</td>
<td>Level indicates nothing effort made to meet standard</td>
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a preassessment) may not be ready for a Tier 3 assignment regardless of the student's age or grade level. Likewise, a primary student who has a passion for a subject and enters the classroom with a strong understanding should not use a Tier 1 assignment to create her product; she should be given the opportunity to work at a level commensurate with her knowledge and ability.

The three tiers encourage differentiation of assessment. A single high school classroom exploring the Constitution, for example, could utilize all three tiers of the Document-Based Question (DBQ) DAP Tool. Those students who have never written a DBQ would use Tier 1; those with experience would use a Tier 2 in order to improve skills; and those with extensive experience would use a Tier 3. Again, the preassessment (this time assessing experience with the specific product) dictates which tier to use. Of course, educators may discover that all students are ready for the same tier.

**SAMPLE DAP TOOLS**

Now look at Figure 1 in relation to Figures 4 and 5 to see how the three innovations of consistent components, grading scales, and tiering system function within each tier of the DAP Tool. Note the specificity of language in the presentation of the poster. Experts in the areas that use products provided guidance on these criteria and word choice.

**USES OF THE DAP TOOL**

On the most basic level, DAP Tools are rubrics. Educators could use one DAP Tool with the whole class. For instance, a language arts teacher may use the Tier 1 Poetry DAP Tool with all of her third graders as they learn how to write poetry. Another example would be an eighth-grade class studying biomes that will construct models to show what they have learned. Each student will be given a tier appropriate DAP Tool before they begin the model. The DAP Tool then guides them in their creation of the model.

Product differentiation provides more sophisticated use of the DAP Tools. DAP Tools could be housed in a single file drawer or a computer file so that students have easy access to them, allowing extended choice in products. If product choice is approved by the teacher, the students then know they can go to this rubric warehouse to find the tool that will assist them in creating the product of their choice. For example, a sixth-grade teacher may create a menu (or Think-Tac-Toe—they go by many names) to provide appropriately challenging learning experiences for her students as they study Maniac McGee. She may list nine learning choices, each with a different product. Not only does the student have choice of the learning experience on the menu, but, ideally, he would also be able to swap out one product for another. He would simply visit the warehouse for the appropriate DAP Tool. The educator would not hesitate because (a) she is interested more in the what the student is learning than how the student is demonstrating what he has learned, and (b) she knows that the DAP Tools will provide the necessary guidance for a high-quality product.

The most sophisticated use of the DAP Tool is assessment differentiation. A single classroom may...
have students using Tier 1, Tier 2, and Tier 3. The preassessment may focus on the level of experience students have in creating the products. If the product is brand new to the student, for example, the teacher would use a Tier 1 learning experience. If the student has created the product numerous times, a Tier 1 would provide no challenge. A Tier 2 or 3 experience would be in order. The teacher could design a preassessment that includes content as well as product. By matching tier to experience level and expertise of the students, the educator differentiates expectations and, consequently, assessments. Because students are familiar with the structure, vocabulary, and grading scale of DAP Tools, the assessment is equitable and appropriate.

### POSTER TIER 1—DAP TOOL

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<th>CONTENT</th>
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<td>• Is the content correct?</td>
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<td>• Has the content been thought about in a way that goes beyond a surface understanding?</td>
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<td>• Is the title easy to see, clear, and well placed? Do labels explain the graphics?</td>
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<td>• Are the graphics (e.g., illustrations, photos, etc.) important and appropriate to the topic?</td>
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<td>• Are the images carefully selected and emphasized? Is the labeling linked to the graphic? Is it pleasing to the eye? Is the spacing deliberate to draw attention to the main parts of the poster?</td>
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<td>• Is the poster mostly free from usage, punctuation, capitalization, and spelling errors? If sources are used, are they cited correctly?</td>
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<td>• Is the content seen in a new way?</td>
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<td>• Is the presentation done in a new way?</td>
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### MEANING OF PERFORMANCE SCALE:

6—PROFESSIONAL LEVEL: level expected from a professional in the content area
5—ADVANCED LEVEL: level exceeds expectations of the standard
4—PROFICIENT LEVEL: level expected for meeting the standard
3—PROGRESSING LEVEL: level demonstrates movement toward the standard
2—NOVICE LEVEL: level demonstrates initial awareness and knowledge of standard
1—NONPERFORMING LEVEL: level indicates no effort made to meet standard
0—NONPARTICIPATING LEVEL: level indicates nothing turned in


### GRADING

DAP Tools work beautifully as both a formative assessment tool and a summative assessment tool. When students receive feedback during the process of creating the product (i.e., formative assessment), they are able to modify, enhance, and hone that product—whether that feedback is content-related or presentation-related.
This feedback then actually becomes feed forward:

Feed forward is equally important to learners’ progress: while feedback focuses on current performance (and may simply justify the grade awarded), feed forward looks ahead to the next assignment, offering constructive guidance on how to do better in future work. A combination of the two ensures that assessment has an effective developmental impact on learning (provided the student has the opportunity and support to develop their own evaluative skills in order to use the feedback effectively). (Gray & Ferrell, 2014, para. 8)

The DAP Tool can also be used formatively by the student as he or she objectively examines each bullet on the DAP Tool in relation to the product being created. Ideally, the student would determine strengths along with areas for improvement. DAP Tools can also be used by peers for formative assessment. In these instances of formative assessments, grades are not typically

**MEANING OF PERFORMANCE SCALE:**

6—PROFESSIONAL LEVEL: level expected from a professional in the content area
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0—NONPARTICIPATING LEVEL: level indicates nothing turned in

When utilizing DAP Tools in this manner, the educator can approach it analytically or holistically. For example, if using the DAP Tool in an analytical way, the teacher might take the total number of descriptors (e.g., 12), and, considering that there will hardly ever be a Level 6 Professional marked on a DAP Tool, multiply that by 5, which equates with Level 5 Advanced. This means that the total possible score would be a 60. If the goal is meeting the standard, then 48 (based on Level 4 which is the proficient) would be the lowest A. The beauty of approaching the grade this way is that the teacher can emphasize important components—such as counting the content section double or doubling the graphics portion on pamphlet because that has been an area of concern or emphasis.

Use caution when transferring any rubric to a grade book. Arter and Chappuis (2006) argued the importance of logic in this endeavor, especially when approaching rubrics using percentages: “Percentages don’t accurately represent level of learning as measured by a rubric” (p. 116). For example, if a 3 is circled on one component, the student is making progress toward the standard (according to the meaning of the performance scale). To simply divide 3 by 5 (not a 6 since it is rarely ever possible), the percentage is 60%. For most traditional scales, a 60% is a D—and that grade certainly does not reflect someone who has almost reached the standard. Arter and Chappuis (2006) suggested the logic rule: “look at the descriptions of the various levels and decide on direct conversions from rubric scores to grades without first converting to percentages” (p. 116). So, for instance, take the earlier example where the DAP Tool had 12 descriptors, and suppose the average score for those descriptors on the five-point scale was 3.75. The percentage would be 75%, a C by most standards. But in the DAP Tool language, this is just .25 from reaching the standard, which is an A. Logic and common sense indicate that a 3.75 is more in the B to B-range. See Creating and Recognizing Quality Rubrics (Arter & Chappuis, 2006) or Assessing Differentiated Student Products (Roberts & Inman, 2015a) for more detailed examples.

**BENEFITS OF USING THE DAP TOOL**

The benefits to using a protocol that assists students in developing products as well as educators in assessing them are numerous:

- DAP Tools can be used across all content areas and grade levels.
- DAP Tools were created with input from experts who create the products professionally in order to ensure authentic, 21st century workplace demands.
- Students have a reliable guide to create a product by authentic industry standards.
- Teachers can branch out from their typical product offerings to better meet student interests and strengths. See Figure 6 for a Product List.
- Students can readily have choice in which products they wish to make.
- The language is the same for Content, Creativity, and Reflection for all tiers. Because Presentation is the only one that changes, it is the only component that needs to be taught, and that is only the case when students have not created the product before. This consistency saves valuable learning time.
- The learning ceiling is removed with the grading scale, thus encouraging all students, especially those with gifts and talents, to strive for continuous improvement and growth.
- The three tiers make differentiation of assessment possible.
- Students hone metacognitive skills via the Reflection component. This promotes independence and responsibility for learning.
- A completed DAP Tool can serve as a preassessment in any or all of the four components.

Although there is a time and place for pen-and-paper assessments, product development can help students develop 21st century skills, including critical and creative thinking. Adults create products in their work, so developing high-level products in school prepares students for life beyond school. Products promote excellence and continuous progress in school and beyond.

**REFERENCES**


Tracy Ford Inman, Ed.D., is associate director of The Center for Gifted Studies at Western Kentucky University. She has taught English at the high school and collegiate levels, as well as in summer gifted programs. In addition to writing and co-writing several articles, Tracy has co-authored three books with Julia Roberts through Prufrock Press. They received the Legacy Book Award from the Texas Association for the Gifted and Talented for Strategies for Differentiating Instruction: Best Practices for the Classroom. Tracy co-edited the Legacy Award winning Parenting Gifted Children: The Authoritative Guide from the National Association for Gifted Children.

Julia Link Roberts, Ed.D., Mahurin Professor of Gifted Studies at Western Kentucky University, is Executive Director of the Carol Martin Gatton Academy of Mathematics and Science in Kentucky and The Center for Gifted Studies. Dr. Roberts is on the Executive Committee of the World Council for Gifted and Talented Children and past president of The Association for the Gifted. Her writing focuses on differentiation, gifted education, and advocacy. She received the 2011 Acorn Award as the outstanding professor at a Kentucky 4-year university, the first NAGC David Belin Advocacy Award, the 2012 NAGC Distinguished Service Award, and the 2011 William T. Nallia Award for innovative leadership from the Kentucky Association for School Administrators.

**PRODUCT LIST**

The Lady Cans, which started in 2009 with six girls, now compete annually in the FIRST Robotics competition, which aims to involve middle and high school students in engineering principles as they design a robot to complete a game challenge. The details of the competition are released to teams each January, and teams then have 6 weeks to complete their robot, plus write a business plan and prepare for presentation of both aspects. Since its inception (one of the team members, Claire1, a senior at Austin’s Anderson High School and a 5-year member of the team, notes that the team came about when one of its founding members “wanted to participate in a robotics program that was separate from her big brother’s team”), the team has been supported wholeheartedly by the Girl Scouts of Central Texas, which provides “an environment where [girls] can explore their skills and fulfill and go beyond their potential,” Claire adds. (Claire also mentioned that the girls continue to collaborate with the team they spun off from—Anderson’s AusTIN 1The girls’ last names have been omitted in following with Girl Scout policy.

“Part of our core values is to make sure that every girl learn the skills necessary to be confident in a STEM field and in the FIRST community.”

Although these girls love what they do with the engineering of their robots, I learned that their work on the team goes beyond such skills. Last year, the Lady Cans not only competed in the FIRST Robotics Competition, but also took on the “Leave Your Legacy Business Plan Challenge” sponsored by Dell, where they were required to develop a business plan focused on the girls’ community impact initiatives. The team also created a video to

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convince Dell to invest in its business plan. And three of Dell’s top executives, including Michael Dell himself, ultimately met with the girls, agreeing to invest $3,000 in the team’s plan to expand its robotics camp to local Boys and Girls Clubs after the Girl Scouts won the overall competition.

Arianna, a junior from Austin’s McCallum High School, suggests that the group encourages girls to tackle any skill sets they’re wanting to develop: “Part of our core values is to make sure that every girl learn[s] the skills necessary to be confident in a STEM field and in the FIRST community. If a girl wants to learn programming, computer aided design, business skills, designing websites, managing our social media or running a business, we really make sure that they get the opportunity to do so. We pride ourselves on our inter-team education.” Claire adds that she’s seen how her early passion for writing could be adapted to fit different activities, growing her written skills “exponentially.”

All three girls are passionate about the encouraging welcome they found with the Lady Cans team, suggesting that girls wanting to get started with such a team or other group not be afraid to jump right in and ask questions or share their ideas. They told me they hope girls take on the mantra of “Just do it” and get “involved as early as possible,” and more importantly, realize the many chances out there for developing one’s passions: “Being part of the millennial generation, we have an opportunity that not as many women have faced recently—an opportunity to do what we want to do while still continuing to change societal stigmas facing women.” (And yes, those are the girls’ words to me when I asked what advice they’d give other girls wanting to get involved in STEM areas—can you see the powerful impact such a message could have on your students?) By coupling the robotics team with the community outreach principles central to the Girl Scouts’ mission, the Lady Cans have truly seen the value of STEM beyond their textbooks and classroom experiments. Arianna puts it best: “FIRST has really allowed me to use what I learned in school in a real-world application. I can now take the math and physics that previously made no sense and make it relate to what I’m doing. It’s extremely fulfilling to see the ideas that come out of my brain evolve into a 3-dimensional object that can be used in the industry.”

Teachers and parents, I know I’m not alone in noticing the amazing work of young Texans. We really do have some of the best and the brightest right here at home! The TEMPO board wants to see the fantastic things your gifted students are doing, too! Please submit your students’ outstanding work (and get creative—artwork, poems, stories, essays, or personal narratives are all welcome!) to me at lacy@cmptn.org. I’d love to help feature your students in a future issue of TEMPO!
Since the 1987 mandate in Texas to identify and serve gifted students at all grade levels, school districts have implemented a variety of practices to address the identification standards outlined in the Texas State Plan for the Education of Gifted/Talented Students (TEA, 2009). In brief, the Texas State Plan identifies these 10 identification standards for districts to be in compliance (TEA, 2009, pp. 3–7):

- Written Board-approved identification policies are disseminated to parents (1.1C);
- Provisions in the Board-approved policies regarding transfers, furloughs, reassessments, exiting, and appeals are included (1.2C);
- Annual identification of students showing potential in each area of giftedness is conducted (1.3.1C, 1.3.2C);
- Students in grades K–12 should be identified (1.4C);
- Data are collected from multiple sources for each area of giftedness (1.5.1C);
- Assessments are in a language students understand or are nonverbal (1.5.2C);
- At least three criteria are used to identify K–12 students for services in each area of giftedness offered by the school district (1.5.3C, 1.5.4C, 1.5.5C);
- Qualitative and quantitative measures need to be included within the criteria (1.5.4C);
- Access to assessment is available to all students in the school district (1.6C); and
- A committee of at least three district or campus educators who have training in nature and needs of gifted and talented students review data (1.7C).
Mostly a Good Practice or Mostly a Bad Practice?

<table>
<thead>
<tr>
<th>Mostly Good Practice</th>
<th>Mostly Poor Practice</th>
<th>Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Poor</td>
<td>1. The school district uses a standardized, norm-referenced creativity test to identify students for the gifted math program.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>2. Using curriculum-based and dynamic assessments, teachers nominate students for the gifted education program. Students are then administered an achievement and an ability test.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>3. Because 90% of students in the school district come from poverty, all students are given a nonverbal intelligence test. Those who meet the criterion are tested further.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>4. Teachers, parents, and students nominate students for the gifted program annually.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>5. If students pass the STAAR test, they are eligible to be nominated for the gifted program.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>6. Students must perform in the top 2% or 130 on standardized, norm-referenced assessments to be served in the gifted education program.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>7. The school district uses a portfolio of products and other work, parent and teacher checklists, and an ability test to identify kindergarten students for services in different subject areas.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>8. The school district uses different criteria for admission to the gifted education program depending on the campus demographics.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>9. The same set of assessments is administered to all students during the identification process.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>10. Parents appeal the decision of the campus committee regarding their child’s lack of placement in the gifted program to the School Board as outlined in the Board Policy Handbook.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>11. Scores from each of the five identification instruments are entered on a common form where each score is given a rating from 1 to 5. A five represents a score of 124 or above or within the 95th percentile or above, a four represents a score of 121 to 123 or within the 91st to 94th percentile range and so on. If a student scores a 16, he or she is admitted to the program.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>12. Students need to meet a minimum intelligence test score to be admitted to the gifted education program.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>13. Because the elementary school’s program focuses on general intellectual ability, students are reevaluated before they transition to the middle school program because it is more focused on core subject areas.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>14. A school-based committee comprised of the principal, the counselor, the gifted education coordinator, and gifted, general, and special education teachers reviews all of the information for each student and makes decisions for identification and/or for exiting services.</td>
</tr>
<tr>
<td>Good</td>
<td>Poor</td>
<td>15. The school district has developed gifted education services in the four core subject areas and has identified different instruments to identify students for each service.</td>
</tr>
</tbody>
</table>

Although most of us are very familiar with these identification standards, I believe it is important to review them from time to time and consider how they might be implemented in your school and how they might relate to student outcomes. On the chart to the left, check yourself by identifying the following examples as mostly good or poor practices to see how your thinking aligns with researchers in the field of gifted education regarding the best practices in the identification of gifted and talented students.

Answers to Mostly a Good Practice and Mostly a Poor Practice

1. Poor

The assessments that are used in the identification process need to be aligned to the talent domain and to the goals of the program (Johnsen, 2012). Within the context of schooling, creativity is best examined within the academic domain itself (Wai, Lubinski, & Benbow, 2005) because of the difficulty in establishing a relationship between creativity tests and their prediction of substantial accomplishments (Renzulli, 2005). For example, with domain-based creativity a teacher might collect products that show the many different ways a student solves a math problem or the variety of metaphors used in writing an essay. If schools are interested in examining creativity beyond the academic domains such as in the arts, then a consensual assessment approach appears to have the most research support (Amabile, 1982, 1996). In this approach, experts in a particular field such as art, music, or theater use their judgment and experience to evaluate creative products and performances. Even at the elementary level strong agreement exists among raters in judging students’ performances (Baum, Owen, & Oreck, 1996).
2. Poor
In this example, the teacher is used as the sole source of referral for additional testing and acts as a gatekeeper for the identification process. Research studies indicate that teachers’ perceptions may be influenced by preconceived notions of giftedness such as gender stereotypes (Siegle & Powell, 2004), academic achievement (Hunsaker, Finley, & Frank, 1997), socioeconomic background (Hunsaker et al., 1997), verbal ability and social skills (Speirs Neumeister, Adams, Pierce, Cassady, & Dixon, 2007). Although dynamic (e.g., testing, teaching, and retesting) and curriculum-based assessments (e.g., observations of problem solving or curricular tasks) can help with identifying students from traditionally underrepresented groups (Borland, 2014), teachers will still need professional development to understand all aspects of giftedness (Briggs, Reis, & Sullivan, 2008).

3. Poor
In this example, similar to the teacher nomination above, a single source is used. In this case, the gatekeeper is a quantitative measure instead of a qualitative assessment. Nonverbal tests have been viewed as reducing linguistic, cultural, or economic obstacles that keep underrepresented groups from accessing gifted and talented services (Naglieri & Ford, 2003). On the other hand, some researchers have challenged this assumption by suggesting that nonverbal tests do not predict performance in academic domains (Lohman, 2005b). Although data are mixed regarding the predictive validity of various nonverbal assessments, the Test of Nonverbal Intelligence (TONI), for example, was able to predict Hispanic children’s cognitive development (Gonzalez, 1994) and was also able to predict scores on achievement tests (Mackinson, Leigh, Blennerhassett, & Anthony, 1997). While both camps would support the use of nonverbal tests with English language learners, any test needs to be supplemented with other data and matched to student characteristics (Worrell & Erwin, 2011). In this way, students are able to demonstrate their talents in areas that are not assessed by one measure. Moreover, when the majority of students are in populations that are traditionally underrepresented in gifted programs, the school district may need to consider the development of local norms. National norms are built on the assumption that all students are afforded a similar educational opportunity (Lohman & Lakin, 2008). Since this is not the case, local norms are able to account for differences in socioeconomic status, race/ethnicity, and parental education (Worrell & Erwin, 2011).

4. Good
This example uses multiple sources (e.g., teachers, parents, and students) to nominate students for the gifted program. Similar to the need for professional development of teachers in understanding all aspects of giftedness, parents also need to understand the characteristics of gifted and talented students and receive nomination forms that list observable behaviors (Worrell & Erwin, 2011). Parents do provide important information about behaviors that might not be observed at school such as interests and completing academic work at home (Lee & Olszewski-Kubilius, 2006). When trained, teachers are reliable sources of identification information and are best for providing information about psychosocial aspects of high functioning such as student motivation, self-regulation, and task commitment (Borland, 2014). Although some researchers have supported the reliability of peer nominations (Cunningham, Callahan, Plucker, Roberson, & Rapkin, 1998; Johnsen, 2011), others suggest that peers may be influenced by popularity (Blel & Pfeiffer, 2007). Therefore, all sources of information should have training to increase their understanding of gifts and talents and have checklists that assess observable behaviors in different domains to increase their reliability across observers.

5. Poor
In this example, similar to the teacher nomination and the nonverbal assessment above, a single source is used. Moreover, the STAAR test is not intended to identify students for gifted and talented programs and will most likely have a ceiling effect for advanced students. In other words, there are not enough items on a grade-level test to examine above-level performance (Swiatek, 2007). Another weakness is that students whose language and academic skills differ from those on the state’s high-stakes test may be regarded as academically deficient and not suited to high levels of academic challenge (Gallagher, 2004). While achievement tests are certainly good sources of information, they assess what a student has already acquired in or outside of school. Schools need to consider whether or not the goal of the program is to serve students who already are clearly more advanced than their peers or those who have the potential (Lohman, 2005a). Remember that the state’s definition clearly states, “gifted and talented students mean a child or youth who performs at or shows the potential for performing at a remarkable high level of accomplishment” (Texas Education Code, 29.121. Definition, TEA, 1997, p. 18).

6. Poor
Setting a cutoff within the top 2% or a 130 standard score does not consider the standard error of measurement (SEM). Since all tests have some error, a single test score should be viewed as an estimate of a student’s actual performance. For example, suppose that Kori scored 125 on an intelligence test with an SEM of
5 points—missing the school district’s cutoff by 5 points. One would expect that 68% of the time her true score would be within the range of 120–130 (adding and subtracting one SEM from 125); 95% of the time, within the range of 115–135 (adding and subtracting two SEVs from 125); and 99% of the time, within the range of 110–140 (adding and subtracting three SEVs from 125). In interpreting Kori’s score, if she were to take the test again, she might conceivably score within the above average (e.g., 110) to very superior (e.g., 140) range 99% of the time (Johnsen, 2011). Given the SEM and errors associated with any test’s ability to predict long-term performance, a school district’s goal should be to set cut offs that serve the largest number possible, not restrict students whose potential needs to be recognized and developed.

7. Good

This example uses multiple sources (student, parent teacher), and varies the formats (portfolio, checklists, tests), which can identify individual student strengths within a specific domain. Portfolios are able to showcase skills and are predictive of future performance (Johnsen & Ryser, 1997; VanTassel-Baska, 2008). Educators should be cautious, however, that items within the portfolios represent not only classroom projects but also students’ interests and talents within and outside of the school setting (Briggs et al., 2008).

8. Poor

Setting different criteria for different schools raises access concerns according to the Office for Civil Rights (Trice & Shannon, 2002). All aspects of the identification process should be applied in a nondiscriminatory manner. In addition, researchers suggest that differences among ethnic/racial groups on intelligence tests are manifestations of an achievement gap, not bias (Frisby & Braden, 1999; Reynolds & Carson, 2005; Worrell, 2005). To increase the inclusion of underrepresented populations, these practices are recommended:

- Training teachers in multicultural awareness so that they recognize diverse talents (Briggs & Reis, 2004; Ford, Moore, & Milner, 2005),
- Implementing talent development opportunities prior to identification (e.g., front-loading; Briggs et al., 2008),
- Assessing pre-skills—those that would lead to advanced skills within a domain (Worrell & Erwin, 2011),
- Using performance and alternative assessments such as observations of students during enriched lessons and student work portfolios (Briggs et al., 2008),
- Emphasizing informal assessments versus formal assessments (Briggs et al., 2008), and
- Using multiple indicators of gifted behaviors (Frasier & Passow, 1994).

9. Poor

The assessments need to be aligned to the program and to each student’s characteristics. For example, ability might be measured differently for students who are non-English speakers versus those who are fluent in English. Multidimensional assessments need to address appropriately diversified services and the diversity of students (Robinson, Shore, & Enersen, 2007).

10. Good

In this example, the Board has outlined its policies and the parents are following them (TEA, 2009).

11. Poor

This approach has a number of problems. First, combining scores doesn’t identify the strengths of individual students. Examining each criterion separately allows the committee to look for the student’s best performance and provides information for programming (Johnsen, 2011). Second, as mentioned previously, rigid cutoff numbers do not consider measurement error, neither do ratings from 1 to 5. Is there really a true difference in point values when considering a student who scored at the 94th percentile versus the 95th percentile? Third, the approach is statistically unsound. Standard or index scores can be manipulated (e.g., added together) but ratings cannot (see Johnsen, 2011). Case study approaches are much better in identifying students’ strengths and needs.

12. Poor

Intelligence tests are a good predictor of school performance but
are just one source of information. Multiple sources and criteria should be used in making decisions regarding a student’s gifts and talents. Intelligence tests are also not sufficient in predicting outstanding achievement or eminence and should be used along with domain-specific assessments (Terman, 1925; Worrell & Erwin, 2011).

13. Poor
This example is primarily a program services problem. The program needs to provide a learning continuum of service options (TEA, 2009). They need to be comprehensive and cohesive so that students’ talents can be developed beginning in kindergarten through grade 12. If a continuum is present, then there is no need for reevaluating students as they transition from the elementary to the middle school.

14. Good
Assuming that the committee members have received training in gifted education (TEA, 2009), this example is an excellent practice because it involves educators with different perspectives who review all of the assessment information. Including special educators also assists the committee in identifying twice-exceptional students—those with gifts and disabilities. Twice-exceptional students may be overlooked because their deficits may hide their gifts and vice versa (Pereles, Baldwin, & Omdal, 2011).

15. Good
The school district in this example has aligned its assessments to services and to students. They understand that students have different strengths that need to be recognized and developed through appropriate services.

In reviewing all of the examples, these best practices emerged as those most often supported by researchers and the Texas State Plan (TEA, 2009):
• policies should provide a frame-work for identification procedures and due process;
• all involved in the identification process should receive professional development, which should include multicultural awareness;
• identification procedures are conducted consistently and reliably across the school district so that all students have equal access to services;
• assessments need to be specific to each student and matched to program services;
• multiple sources are important in providing a comprehensive picture of the student’s gifted behaviors;
• along with standardized tests, multiple forms of assessments should be used (e.g., portfolios, dynamic, performance, curriculum-based, checklists);
• technically sound instruments should have sufficient ceiling to assess the advanced knowledge and skills of gifted students;
• the interpretation of assessments should be conducted by individuals knowledgeable about gifted education and tests and measurement (e.g., reliability and validity);
• the selection committee needs to be comprised of educators across specialties to ensure the identification of twice-exceptional students;
• special attention needs to be paid to underrepresented populations; and
• cutoff scores should consider the standard error of measurement and should not be rigidly applied because of various contextual factors—case studies are best.

**LEARNER OUTCOMES**
Implementing these best practices should lead to the desired student outcome of identifying all students who need gifted education services. Desired student outcomes might include whether or not equal percentages of students are being nominated, identified, and selected across schools; how identified students’ succeed and are retained in the programs; and/or the how the program reflects the school district’s demographics (see NAGC, 2010, and TEA, 2009). The school’s annual evaluation (see 5.3C in TEA, 2009) might examine how the foundations for identification influence practices and how both of these influence student outcomes (see Figure 1).

Foundations such as the school district’s definition of gifted and tal-
When educators work together and embrace best practices, students who need services in gifted education will be identified.

...
J. R. Cross (Eds.), *The handbook for school counselors serving gifted students: Development, relationships, school issues, and counseling needs/interventions* (pp. 463–475). Waco, TX: Prufrock Press.


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She has written three tests used in identifying gifted students: *Test of Mathematical Abilities for Gifted Students (TOMAGS)*, *Test of Nonverbal Intelligence (TONI-4)*, and *Screening Assessment Gifted Students (SAGES-2)*. She serves on the Board of Examiners of the National Council for Accreditation of Teacher Education and is a reviewer and auditor of programs in gifted education. She is past president of The Association for the Gifted (TAG) and past president of the Texas Association for the Gifted and Talented (TAGT). She has received awards for her work in the field of education, including NAGC’s President’s Award, CEC’s Leadership Award, TAG’s Leadership Award, TAGT’s President’s Award, TAGT’s Advocacy Award and Baylor University’s Investigator Award, Teaching Award, and Contributions to the Academic Community. She may be reached at Department of Educational Psychology, Baylor University, One Bear Place #97301, Waco, TX 76798, USA or Susan_Johnsen@baylor.edu.
Kahoot! and Google are favorite digital tools of many classroom teachers, and are viewed by teachers as effective and efficient. These tools provide students opportunities to engage with the same tool simultaneously. All students may access the tools at different times addressing varied issues and topics all in one class period. Students receive immediate feedback from the teacher, and teachers are able to monitor and provide timely feedback to their students.

Kahoot! is a website that allows teachers to create quizzes that students take in a game-like format using their mobile devices as a response system. Kids absolutely love it! Teachers sign up for a free account at getkahoot.com. Once an account has been created, the fun begins! Kahoot! provides for the creation and sharing of quizzes and products with educators throughout the country. Creating a Kahoot! is very simple; just add multiple-choice questions and answer choices. Questions can include images or graphs as well. Teachers may add as many or as few questions as they like and may choose to use a quick 5-question warm-up or a full 50-question review; it’s entirely up to the teacher.

Once the Kahoot! is created and finished, the teacher simply hits PLAY. A game room pin is displayed via the data projector and students will log in using that game pin. Students can use any device that connects to the Internet to join the game. Some devices that can be used are iPhone, iPad, Android, Chrome books, Kindle Fire, laptops, or any personal computer (PC). Students go to Kahoot!. it on their device and enter the game pin and their name, which will appear on the teacher’s page. This page can then be projected on a screen for viewing by the teacher’s class. As the students join, the teacher chooses a video or an image to show in the background. When all the students have joined the room, the teacher clicks on the “start” icon and the quiz begins. Questions and answer choices are displayed while fun game-show type music plays. Students use their device to tap on the correct answer choice and earn points, not only for answering correctly but also for how quickly they answer. When time runs out for a question, a bar graph is displayed showing how the class answered and which choice is correct. It also shows the top 5 players and their scores. The game continues, as well as the excitement, as students progress to the end of the quiz. After the final question, the winner, score, and correct question responses are displayed. In addition, the teacher can download all the answer responses for each student.

Kahoot!s that have been shared by other educators are also available online. A teacher can search topics and find matching Kahoot!s. Teachers can use these shared Kahoot!s exactly like they are, or they can be duplicated and edited by the teacher and saved as their own Kahoot!. There are a wide variety of Kahoot!s on the site and it grows daily. Students can also create their own account and make Kahoot!s. Kahoot!s may be created by gifted and talented students as a differentiation activity that can then be experienced by the class. Kahoot! is easy, fun, and free. What a great tool for engaging student learning!
Google technology tools afford gifted students opportunities to engage in asynchronous online collaboration. Groups of students may collaboratively use Google Drive, Google Docs, Google Forms, and Google Slides to create products, edit, store, access, and share documents, files, and folders all at the same time. Teachers and students will need to begin by registering for a free Google Gmail account. Account benefits include use of the Google digital tools and free online storage which is accessible from anywhere there is an Internet connection.

Both student and teacher work together simultaneously, sharing learning and creating products that reflect different perspectives. Use of the Google Web 2.0 tools facilitate social interaction, active learning, decision making, and communication. In addition, these tools allow for automatic saving of work; work can be archived, viewed, and edited by anyone who has the URL. All created products can be maintained in one location.

Google Drive and Google Docs are very similar. Students may use Google Docs to collaborate in the writing and editing process. Whether students are signing up for group projects, signing up for potluck dinner items, or scheduling a conference time with the teacher, Google Drive is a great tool to use. There are no papers to pass around, no papers to lose, or work that’s lost forever because it was not saved. Contributions to Google Drive or Google Docs are always automatically saved and can be retrieved any time after being created. Students may create journals using Google Docs and, instead of taking home loads of journals, the teacher can access student journals saved in Google Docs. Students are able to add photos, videos, and online links to books, articles, and other resources to make their journals more interactive and personalized. In addition, Google Docs makes collecting and compiling brainstormed lists, feedback, thoughts, and reflections a quick process involving all students at the same time.

Class discussion can be enriched with the use of Google Docs and Google Drive as a central place for students to record their ideas while viewing and piggy-backing on the ideas of other students. A Google Doc/Google Drive can be created using a stimulating discussion prompt to which students are asked to respond. Following time for thought and recording of ideas, the teacher can then project the results on the screen and lead the class in a discussion of the shared ideas. The use of the K-W-L strategy in combination with Google Docs or Google Drive provides a brainstorming opportunity resulting in increased ideas generated and immediate recognition of what the class Knows (K), Wants to know (W), and what they have Learned (L). The strength of the collaborative process afforded by Google Docs and Google Drive is that every student in the class has the opportunity to contribute to the final product in a timely manner as ideas are recorded and saved for retrieval at a later date.

An almost paperless classroom can be created when handouts are stored using Google Drive or Google Docs. Students who are absent from class on days when certain material is discussed are able to access those materials and benefit from the handouts, video clips, and other resources archived in Google Drive or Google Docs.

Google Forms can be used to create surveys, rubrics, opinion polls, and auto-graded quizzes. A survey can be developed to assess student perceptions of a variety of issues; the results are tabulated, compiled, and graphed for meaningful and immediate classroom discussion. In addition, reading records, volunteer hours, and word walls can be initiated, added to, and maintained over time.

Using Google Slides, presentations can be created and edited to accompany group presentations, and members of the groups can work on the presentation at the same time. Students who have investigated assigned portions of an overall project are able to work on their section of slides simultaneously online. No longer do students, separated by distance and time, need to struggle with how to complete a group, out-of-class project. Teachers and students can create products, maintain and access documents, surveys, and slide presentations at one central location. Time is saved and work is made so much manageable.

Kahoot!, Google Docs, Google Drive, Google Forms, and Google Slides enable students to work online collaboratively on projects at any time while teachers are able to monitor student progress and provide feedback for improvement as the projects progress. The use of these tools results in gifted students being empowered as independent, engaged learners, and teachers being able to accomplish the goal of increasing student-student collaboration effectively and efficiently.
A variety of formative and summative assessments are needed when appraising gifted students’ learning and when differentiating the curriculum. These include standardized achievement and benchmark tests, portfolios, and product and performance assessments. Each has its purpose. Standardized achievement and benchmark tests are developed to measure the mastery of a particular set of knowledge and skills; portfolios generally include student work that assesses a student’s progress and accomplishments in a given area; and product and performance assessments assess more complex thinking such as problem solving, creativity, and research.
Because most standardized assessments do not have enough ceiling to measure gifted students’ growth (Ryser & Rambo-Hernandez, 2014) and do not have sufficient items to assess the depth of gifted students’ learning (VanTassel-Baska, 2008), more and more educators are looking to other types of assessments to differentiate their curriculum and identify the effects of their instruction on gifted students’ outcomes. These alternative assessments have been described as authentic and performance-based. Frey and Schmidt (2007) have further defined authentic assessments as the measure of ability on tasks that represent real-world problems and performance assessments as measures of skills or abilities. These researchers suggest that quality formative assessments should provide feedback to the teacher for the purpose of improving instruction, and feedback to students about their quality of learning. Therefore, assessments need to be aligned not only to above-level content standards but also to the quality of learning expected from gifted and talented students.

To identify effective methods for assessing advanced products and performance in gifted populations, this review included articles published since 2004 in Gifted Child Today, Gifted Child Quarterly, Journal for the Education of the Gifted, Journal of Advanced Academics, and Roeper Review. To be included, articles needed to examine the assessment of advanced products and performances in K–12 classrooms. Articles that included university-level assessments and studies conducted outside of the United States were excluded. Using these criteria, 16 articles were identified and summarized.

The type of articles found included empirical studies (n = 11) and recommendations for the development and implementation of performance and product assessments (n = 5). Populations studied were diverse and included elementary, middle, and high school students as well as teachers.

Advocates for alternative product and performance-based assessments suggest that students represent learning in multiple and creative ways (Duggan, 2007). Because most state assessments are developed for typical students, other types of assessments need to be used to assess student growth (Ryser & Rambo-Hernandez, 2014). These assessments need to be related to the learning outcome and include advanced, higher level thinking and open-ended problem-solving tasks that challenge gifted learners to demonstrate deep meaningful learning (Duggan, 2007; Kaplan, 2008; VanTassel-Baska, 2014). In addition, Kaplan (2008) suggested that the assessments represent authentic work of the discipline, extend the understanding of the subject matter, relate to the student’s interests, foster personal and social goals, and reinforce the skills of both productivity and presentation.

A variety of instruments are useful when assessing advanced products and performances (Jolly & Kettler, 2004; Feng, VanTassel-Baska, Ouek, Bai, & O’Neill, 2004; Kim, Van Tassel-Baska, Bracken, Feng, & Stambaugh, 2014). Jolly and Kettler (2004) assessed leadership abilities through standardized instruments, self-assessment, peer-assessment, and adult observations. They reported a relationship between students’ self-report of ability and the observations of others (Jolly & Kettler, 2004). Feng et al. (2004) were able to assess not only academic growth but also the students’ views of the curriculum when using multiple assessments. In addition, researchers found that traditional assessments, such as standardized tests, were effective for measuring reasoning skills and content-area achievement but that nontraditional methods, such as performance-based assessments and tests of critical thinking, were needed to measure more complex thinking (Kim et al., 2014).

Including students in the assessment process was studied in three of the articles included in this review of the literature (Newman, 2004; Sriraman, 2004; Thompson & McDonald, 2007). Newman (2004) found that when students were involved in self-assessment during the creative process their products were of higher quality. Likewise, Sriraman (2004) discovered that when mathematically gifted students were asked to reflect upon and analyze their own thinking processes they were able to produce at a level characteristic of professional mathematicians. Being given the opportunity to create both assignments and assessments for their own products has also proven motivating to gifted learners (Thompson & McDonald, 2007). The most creative and expressive products resulted from student-constructed assignments.

An additional theme found in our examination of the product assessment literature was the evaluation of written products, which was discussed in three of the reviewed articles (Hall, 2007; Kaufman, Gentile, & Baer, 2005; Olthouse, Edmunds, & Sauder, 2014). The authors found that students use written products to reflect their ideas, identities, emotions, and intellectual understandings in
one concrete package (Hall, 2007; Olthouse et al., 2014). In evaluating written products, researchers reported that creative writers rate student compositions similarly to experts in the field using the consensual assessment technique (Kaufman, Gentile, & Baer, 2005). This technique supports the practice of review, feedback, and collaboration in the writing process with gifted learners.

Product and performance assessments were used to show student growth in five intervention studies (Feng et al., 2004; Hertzog, 2007; Kim et al., 2014; Newman, 2004; Powers, 2008). Researchers (Feng et al., 2004; Kim et al., 2014) found that the use of the Integrated Curriculum Model (ICM) resulted in increases in grammar, persuasive writing, literary analysis and scientific content knowledge, concept mastery, and research skills. Newman (2004) reported that Talents Unlimited resulted in more highly rated, quality products than the control group. Moreover, Power (2008) found that independent study increased students’ motivation and fostered critical thinking. On the other hand, Hertzog (2007) reported a number of internal and external barriers when implementing a project approach in two first-grade classrooms. These included the loss of control, development and implementation time, and district curriculum and state mandates. Administrative support therefore is crucial when implementing more problem- and project-based learning.

A review of the recent literature in the area of differentiated product and performance assessments suggests the need for establishing criteria for the evaluation of learning through student production. Many instruments and models have been established in the field of gifted education for the assessment of products and performances. When using these assessments, educators need to clarify the purpose or learning outcomes, target high-level thinking, use multiple formats and approaches, involve students in the assessment process, align the learning activities with the learning outcomes, and carefully interpret the results when differentiating the curriculum for gifted students.

The author described three examples of using artistic representation of concepts across classroom curriculum—a ninth-grade science classroom, a South Dakota scholarship contest, and a summer program. In each of these examples, students were given the opportunity to choose a product from a list of creative representations such as photography, art, poetry, song lyrics, musical compositions, skits, posters, brochures, and films. The author suggested that when students demonstrated their understanding of concepts through creative products they increased their sense of agency and were able to teach the content to others. When deciding on content to use for artistic products, the author suggested that teachers use either specific text content or broad concepts and should ask themselves the following questions: (a) How many options do we currently give students to demonstrate their understanding of what they learn in school?, (b) How can we benefit from broadening the possibilities for the representation of concepts in the school setting?, (c) How do we foster and develop our students’ creativity through our assignments and assessments?, (d) How can our students benefit from examining the different perspectives from which they encounter problems and develop solutions?, (e) How can artistic representations of concepts promote collaboration between students?, and (f) What significant and specific benefits for gifted students may be gained from the process of representing school-encountered concepts artistically?


This mixed-methods study investigated the effects of implementing William & Mary’s Integrated Curriculum Model (ICM) in science and language arts courses for gifted students. The sample included 973 gifted students from one northeastern suburban school district. Participants had been instructed using the ICM curriculum for 1 year (35%), 2 years (21%), or 3 years (44%) during third to fifth grade. Using pre- and postperformance-based assessments, participants’ growth in language arts and science were examined. In grades 3–5, statistically significant gains were demonstrated in grammar, persuasive writing, literary analysis, and scientific research skills as measured by pre-post Diet Cola Test*, pre-post literary analysis instruments, and pre-post writing assessments. Performance data demonstrated steadily increasing academic growth from third to fifth grade with large effect sizes (from .52 to 1.38), which reflected its practical educational importance. Increasing achievement was demonstrated with repeated exposure over 2 to 3 years. Additional survey data collected from relevant stakeholders, including 367 parents, 110 educators, and 732 students, found that the majority of respondents viewed the curriculum as challenging, promoting peer interactions, and well organized. Limitations
from the research included a lack of a comparison group of gifted students within the school district. Since ongoing growth can be demonstrated by the use of assessments, suggestions for future research included replication studies and investigating of long-term outcomes on other standardized tests like the AP or SAT.

*The Diet Cola Test can be accessed at: https://education.wm.edu/centers/cfge/curriculum/science/materials/index.php


The authors of this article suggested that the difficulty of judging the theoretical benefit of modern assessment approaches, such as performance-based assessment, relates to the lack of common definitions of terms being used by researchers, advocates, and practitioners. Although researchers and teacher educators emphasize the importance of using performance-based assessment, authentic assessment, and formative assessment, teachers do not receive systematic training in using assessment strategies. This lack of training, as well as the absence of common definitions, makes it harder for teachers to apply the findings and recommendations of research to assessments in their classroom. After their review of the literature and a discussion of the differences in conceptualizing and using authentic and performance assessments, the authors provided a summary of the literal definitions, components, formats, and intentions for authentic and performance assessments, and they suggest this categorization scheme:

- The purpose of performance assessment is to measure a skill or ability.
- The purpose of authentic assessment is to measure ability on tasks that represent real-world problems or tasks.
- Formative assessment should be used to provide feedback to the teacher to assess the quality of instruction or improve teaching behaviors.
- Assessment for learning should be used to provide feedback to students to assess the quality of learning and to improve learning behaviors.


In order to study and unravel the multilayer nature of resilience among young men of color, this qualitative study used performance-based products. Through creative writing such as poetry, spoken word, and hip-hop rhymes, three teenage males were able to voice their individual realities and responses to their social and cultural worlds. The three adolescents in this study attended an all-boys program designed for students to talk about their problems in a physically and psychologically safe environment. In one session, the topic of discussion was related to stereotypical images of people of color in society and in mass media. The students in the program showed increased engagement in group dialogues, which led the facilitator to ask the boys to bring a self-composed piece conveying their feelings towards the topic. According to the author, the students’ writings were an interpretive design to better understand students’ personal perspectives. However, to have a complete understanding of the students’ mindset, additional data were collected through social interaction with the participants and non-structured interviews. The use of creative written expression provided a unique direction to develop awareness about the strategies and resources needed to assist the adolescent in facing negative psychological forces. The product of each of the young men illustrated his identity, contrary to the stereotypically portrayed image of being helpless and dysfunctional. The analysis showed that students used familial as well as non-familial resources, such as peers, mentors, or church activities, for support and reducing stressful moments. The author of this article highlighted the importance of using shared experiences as a source of understanding how youth of color utilize their skill and talents to be resilient.

Hertzog, N. B. (2007). Transporting pedagogy: Implementing the project approach in two...
In this qualitative case study, the author identified the issues and strengths of using a project-based approach in two first-grade, low-achieving classrooms. The project approach used in these two classrooms mirrored Renzulli’s Type III enrichment, where students pursue answers to their own questions through three phases. In Phase I, children examine their prior knowledge and determine the areas in which they are most knowledgeable and the areas they need to learn more about. During the next phase, students do field work and collect data through different means such as observations, surveys, and interviews. After data analysis, students in Phase III will share their findings and new knowledge with parents, other students, and teachers. This instructional approach involves students in developing a variety of products including poems, songs, role-playing, drawings, or three-dimensional models. Throughout the academic year, the teachers implemented two enrichment projects. The author collected data using field notes, observations, interviews, and documents related to the teaching activities and student products. The data analysis showed that teachers faced external and internal barriers in implementing a project approach. Although the teachers perceived researchable questions in small group as authentic to learning, both teachers were worried about losing control of the topic and hence pursued the activities as a whole class. In addition, teachers found it hard to let students just work on their projects. In fact, they felt the need to teach them basic skills and provide constant support. Since a project-based approach to instruction requires at least 3 weeks, both teachers decided to implement only two projects, worrying that they could not cover the required curriculum with more projects. Furthermore, projects not only required more time but also required more preparation time. Staying in compliance with the reward and punishment system required by school policies, both teachers realized that extrinsic rewards were in opposition to children being in charge of their learning as well as motivated to learn. For that reason, rewarding intrinsic values such as hard work, critical thinking, creativity, and independent work should be used during project-based approaches. Although both teachers believed that students learned more through projects, they expressed worries and difficulties in assessing students in meeting the district curriculum and state mandates.


The purpose of this descriptive research was to ascertain observable behaviors to identify emergent leaders in problem-solving scenarios and to investigate if a relationship between these identified observable leadership behaviors and leadership self-reports existed. Participants included 83 identified gifted students in eighth through twelfth grades who attended Baylor University’s Interdisciplinary Creative Problem Solving (CPS) Conference. At the onset, participants completed two leadership self-assessments* including one based on the Renzulli-Hartman Scales for Rating Behavioral Characteristics of Superior Students and another founded on the Gifted and Talented Evaluation Scales (GATES). After completion of the CPS process, participants and counselors recorded a member from their group who most exhibited each one of the 12 leadership behaviors outlined on the Leadership Observation Survey.* Observations obtained from students and adults reflected agreement on recognized group leaders. Although each emergent leader exhibited a greater number of leadership behaviors compared to the peers in the group, the specific behaviors most attributed to the emergent leaders were the ability to: (a) keep their group focused, (b) offer compromises satisfactory to the group, (c) garner respect for his or her opinion, and (d) obtain frequent agreement from the group members. Half of the emergent leaders scored relatively higher on their self-assessments than their peers. Limitations of the research included lack of intrarater reliability and observations that were limited only to the conference setting. The authors concluded that gifted leaders can be identified in a relatively short amount of time though observation of leadership characteristics. Expanded services to students gifted in leadership may be a resulting implication of this research.

*Both leadership self-assessments and the Leadership Observation Survey can be accessed at: http://files.eric.ed.gov/fulltext/EJ682653.pdf


The author described criteria for designing project-based learning. She suggested the effectiveness of strategies used with gifted students should be based on practice rather than inclusion or omission of such activities. When designing projects that will act as products of learning, she recommends that teachers should ask themselves several guiding questions: Is the project aligned with standards and learning goals? Does it develop the potential of the learner? Do student explanations of their projects reflect deep learning? How can students define their role as well as the role of others in the creation of the project? The author suggested that projects used with gifted learners should (a) represent authentic work of the discipline; (b) reinforce established content standards; (c) support and extend understanding of the subject matter and mastery of skills; (d) relate to the student’s academic and personal interests; (e) foster academic, personal, and social goals; (f) reinforce the acquisition of the
skills of productivity as well as presentation skills, and (g) be displayed in a context that underscores their relevance for students and their academic contributions.


This study was conducted using the consensual assessment technique where an expert in the field rates the work of an individual. The authors were interested in seeing whether or not the ratings given by gifted writers were similar to those given by creative writing experts. A sample of 27 short stories and 28 poems were drawn from the 1998 National Assessment of Educational Progress (NAEP) Classroom Writing Study for evaluation. Raters participating in this study included eight gifted creative writers, all juniors in high school, from the New Jersey Governor’s School of the Arts and 13 expert judges. Experts represented middle school teachers (N = 4), published creative writers (N = 4), and psychologists in the field of creativity (N = 5). Raters were asked to read the short stories and poems and assign them a rating of 1 to 6 with 1 being the lowest level of creativity and 6 being the highest. Participants were asked to assign ratings based on their own personal definition of creativity. The authors found that ratings reported within and across both groups were closely related to each other, meaning that novices and experts rated the writing similarly. Using this information, the authors suggested that evaluations of creativity by gifted novices in a field may be similar to evaluations given by experts. They also suggested that the findings of this study supported the use and benefits of peer review, feedback, and collaboration between gifted writers in the classroom.


In this study, the authors examined (a) whether the use of the Integrated Curriculum Model (ICM) with students increased their science content knowledge and reasoning and (b) whether the use of ICM increased content and concept mastery in science as measured by pre-post Performance Based Assessment (PBA). Schools were assigned randomly to experimental and comparison groups. The experimental group included 250 students who received instruction in the ICM for 2 years, participated in the PBA for 2 years, and took the first and second year follow-up post-achievement tests. The units in the curriculum intervention aimed at developing an understanding of macro-concepts, scientific reasoning, and investigative skills. In addition, the unit content was aligned with the national and state standards. Teachers who were implementing ICM were trained in the teaching models used in the unit, science content, concept development, and assessments. Both standardized tests and nontraditional assessments were used to assess the learning of students. The Metropolitan Achievement Test was used as standardized measure of science achievement, the Test of Critical Thinking was used as a measure of critical thinking, and PBA was used to assess conceptual understanding and content attainment. Conceptual understanding was shown in students’ responses to open-ended question including examples, features of macro-concepts, and generalization. Content attainment was shown in student’s drawing of concept maps about the topics being studied. The findings of the study showed that the use of ICM increased all students’ learning in concepts and content. Using the PBA the analysis further showed that ICM has benefits for all students, regardless of their initial achievement level, gender, and ethnicity. The authors explained that the reasoning skills and science achievement could be measured by using standardized tests, however, the more advanced, complex science concepts and content needed PBA to be measured. Hence, measuring student learning should be conducted using both traditional and non-traditional assessment.


The purpose of this quasi-experimental study was to determine if instruction using the Talents Unlimited Model would affect the quality and quantity of completed Type III products, which are produced for an authentic audience to address a real-world problem. Research participants included 147 students in third to sixth grade from three Birmingham, AL, suburban school districts. Cluster sampling was used to randomize students and teachers by schools into the treatment or control groups. Students in the treatment group (n = 59) received Talents Unlimited instruction, and control group students (n = 45) were instructed using Renzulli’s Schoolwide Enrichment Model. Each completed Type III products. The quality of the products were measured using the Student Product Assessment Form (SPAF)* of the Schoolwide Enrichment Model that assesses 15 factors related to the product, problem-solving process, and content on a Likert-scale from 1 to 5, resulting in a maximum score of 75. The experimental group’s products were more highly rated than the control group’s products overall.
In the stories and poems, detachment from teachers and curriculum were depicted showing that the relevance of academic content is dependent on the students’ proactive involvement with the content. The authors suggested that teachers need to identify ways of connecting students’ personal values and experiences with the content. In addition, the findings showed that the school should be a place where talent is celebrated instead of a place where one’s abilities need to be hidden. The struggle between academic achievement and social acceptance needs to be addressed by counselors. In addition, academic competition may have negative consequences and may be more positive when individuals compete against their own standards. According to the authors, the written products were tools that reflected ideas, identity, emotions, and intellect in one concrete package.


Researchers in this study addressed the following questions: Does the use of independent study foster motivation and achievement for gifted students? Does student choice motivate student participation and achievement in independent study? How does the partnership of social studies and real-world tasks motivate historical thinking and achievement? While a group of 20 gifted seventh graders were chosen to participate in independent studies tied to inventions in social studies, 16 finished their projects. The independent study (IS) was designed using the Powers Plan, which included the steps of preparation, planning, probing, product, presentation, and portfolio. Students spent time researching inventions throughout history and then creating their own invention that would solve a problem existing now or in the future. Students used a notebook to collect their research findings, reflections, and ideas during the IS process and presented their invention along with a PowerPoint at the end of the unit. Students were graded on their IS using a rubric and then participated in an interview and responded to a questionnaire about the IS process. The author found that students (a) valued the freedom of choice given to them through the IS process, (b) understood the topic to a greater depth, and (c) enjoyed participating in what felt like real-world tasks. Data from the interviews and questionnaires showed that all students were motivated (and challenged) by the IS experience and all said they would like to do it again. Teachers involved in the study said that IS fostered critical thinking skills, provided personal choice and subject depth, and allowed students to use research and computer skills that they would not otherwise have the opportunity to develop.


The current focus on high-stakes testing has led to an accountability movement in American education. Assessment data and growth modeling are used to measure student academic growth and to show adequate yearly progress (AYP). The problem with most current growth models is that they are designed for measuring proficiency in typically developing children, not gifted learners. The authors discussed the introduction of the No Child Left Behind Growth Model Pilot Program (GMPP) in 2001, which used status models to demonstrate AYP. These models looked at a school’s overall level of student proficiency at one point in time but failed to recognize improvement in individual scores. In 2005, the GMPP was modified to include multiple growth models including transition models, trajectory models, and projection mod-
Current growth model practices are expanding to include more than just proficiency measures. Interpretations of growth models now includes growth description (magnitude of growth), growth prediction (future scores), and value-added (causes of growth). The authors stressed that different growth models answer different questions so no single model gives “best results.” More statistically sound growth models are needed to accurately assess gifted students. Criteria for statistically sound growth models include (a) at least three observations or test scores, (b) comparable scores across time, and (c) measures of time for every test administration. In using growth models with gifted learners, educators need to be aware that assessments intended to measure proficiency in typically developing students will contain (a) error when used with gifted students, (b) ceiling effects, and (c) regression to the mean. The authors suggested the use of above-level and computer-adaptive testing options for gifted learners.


In this study four mathematically gifted freshman were given the open-ended “Circumscribing a Triangle Problem” and asked to prove their answers. The author conducted one-hour clinical interviews with the students to document their thinking processes and compare them to those of professional mathematicians. Through the analysis of student work, interview transcripts, and the author’s personal notes, four themes emerged that were similar across all four of the students’ mathematical thinking: visualization, intuition, empiricism (measurement and concrete examples), and reversibility—all of these characteristics are paramount to the work of mathematicians at a professional level. These findings suggest that mathematically gifted students have the potential to think and reason similarly to professionals within the field. Classroom teachers should be aware of the learning process and allow for inductive learning of mathematics for gifted learners rather than solely delivering content using deductive methods.


A teacher-researcher team, using descriptive case study/action research, examined differences in preference and achievement between teacher-constructed and student-constructed assignments and assessments. Sixth-grade participants included 53 students (25 gifted and 29 advanced) in a gifted and talented program at a southwest suburban school. Of these, the teacher identified 15 underachievers (8 gifted and 7 advanced) by comparing academic grades, standardized test scores, and observed student potential. The teacher-created assignment* (and assessment rubric*) allowed a student to select from three different prompts to write an essay on *Jacob Have I Loved* by Katherine Paterson. Subsequently, students were given an opportunity to design their own project and create an assessment to measure their achievement. Data collected from written open-ended questionnaires illuminated...
student preferences and decision-making. Students appreciated flexibility in choosing an essay prompt but selected their topic based on various motivations: underachievers considered the ease; achievers picked the one expected to earn the highest grade; and gifted students generally made personal connection when selecting the topic.

Students overwhelmingly preferred the student-constructed assignment. Underachievers also favored creating their own assessment, but the achievers were equally divided on their preference of student- or teacher-created assessment. With respect to quality of products, the most creative and expressive products resulted from the student-constructed assignment. Limitations of the study included: the number of participants, the lack of previous historical participant data, the single subject (language arts), the particular novel, the choice of an essay as the teacher-constructed project, and the limited measurement of two assignments. Research implications for teacher-practitioners suggest that underachieving behaviors may be reduced by allowing students greater input in selection of products and assessment criteria to demonstrate learning as well as optimizing their motivation and achievement for ‘generating optimal, authentic, and meaningful learning” (p. 217).


This article outlined the need for performance-based assessment (PBA). The author suggested that PBA can be used as a diagnostic tool in identifying what curriculum should be taught and/or which students to place in the various flexible-grouping clusters. They can also be used to assess higher order thinking skills and project-based curriculum. Teachers may use assessment data reflectively because a high score on a performance assessment points to a high-functioning classroom environment. When designing performance-based assessments, educators should clarify the purpose; target high-level skills such as deduction, induction, problem solving, decision-making, and invention; use multiple approaches; and carefully consider the use of assessment results. Teachers may choose to use or modify existing assessments such as ‘The Diet Cola Test*, International Baccalaureate assessments, and AP exams* or refer to the National Association for Gifted Children Common Core State Standards guidebooks for additional prototypes. The author concluded that performance-based formative and summative assessments are indispensable in all subject domains because they provide a comprehensive understanding of student performance capability and evidence of ongoing academic growth.

*AP exam sample free-response questions can be found at www.collegeboard.com and ‘The Diet Cola Test’ can be accessed at: https://education.wm.edu/centers/edg/courses/curriculum/science/materials/index.php

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Please keep in mind the following when submitting manuscripts:
1. Manuscripts should be 2,000 to 10,000 words on a topic related to gifted education.
3. Submit an electronic copy, typed, 12 pt. font, double-spaced manuscript. Use a 1 ½” margin on all sides and number pages.
4. In addition to the title page, a cover page must be attached that includes the author’s name, title, school or program affiliation, home and work address, e-mail address, phone numbers, and fax number.
5. Place tables, figures, illustrations, and photographs on separate pages. Each should have a title and be referenced in the text. Submit electronically with manuscript.
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