

SEE ME in STEM: Exploring Out-of- School STEM Education for Gifted Black Girls

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In rather small increments, conversations and scholarship on the experiences of gifted Black girls (GBGs) are emerging in gifted education literature. The narratives around the experiences of GBGs have largely been invisible or used to compare with the experiences of gifted Black males (Anderson, 2020; Collins et al., 2020). Across other educational sectors, much of the scholarship and research on Black girls has centered on advocacy, equity, and for school spaces to recognize their talents and gifts (Anderson & Coleman-King, 2021; Anderson, 2020). According to Anderson, “Our moments of success or achievement are often framed by educators and peers as coincidental or a surprise, not as a norm” (p. 87). With these issues of erasure and invalidation in mind, there have been several calls for an intersectional approach to understanding the needs, characteristics, and schooling experiences of GBGs in K-12 and postsecondary settings. Black girls are not monolithic; conversations around their needs must factor in age, region, type of schooling experience, class, language, ethnic/cultural background, religion, etc. This begs us to question, what do GBGs need to feel seen, excel, and

feel safe in gifted programming? We must unpack their ways of being (culture), knowing (theory), and doing (ways they are culturally engaged); elements that have primarily been unexplored in gifted education.

While there is more literature on the experiences of Black girls in STEM education, few have addressed the critical need to examine the nuanced realities of GBGs in STEM-related contexts. As we critically reflected on the out-of-school experiences and research on GBGs in STEM, what is missing from GBG experiences is an intersectional lens and approach. Intersectionality theory examines the interconnectedness of social classifications like race, class, and gender; and how the connectivity of these labels create nuanced experiences and layered barriers to access. We can and should provide K-12 and postsecondary STEM programming that is informed by the nuanced experiences, challenges, and abilities of Black girls who exist at the intersection of race, gender, and—because of the stratification of U.S. public schools—socioeconomic

continued on page 16

FEATURE ARTICLES

Cover: STEM *is* for Black Girls

Page 6: Benefits of Visual Journaling

Page 12: Importance of Daily Writing

Page 20: What is Wordplay?



Page 6



INSIDE THIS ISSUE

From the Editor.....	2
Digital Ecosystem.....	3
iMathination.....	4
Making Curriculum Matter.....	5
Sparks of Innovation	9
Taking the Lead	10
Buried Under Books.....	11
The Scholar's Corner.....	19
Unwrapping the Gifted	22



All in a day's lifetime's work!

I recently asked some friends about their educational experiences, and more specifically, inquired about teachers that truly made a difference in their lives. Some of them shared words of wisdom and advice, others had stories of mentors within a certain discipline. There were tales of books, mementos, and cards, all holding a special meaning. While the accounts differed and occurred at varying times along the educational spectrum, the message of each story was the same, and the appreciation felt resonates with experiences that I have had, both as a student and a teacher.

Dreams often begin in the classroom. Teachers, equipped to recognize potential, can consistently offer varied curricular options, enrichment in areas of interest, and suggestions for pursuing real-world opportunities. Aware of the social, emotional, and educational needs of each individual student, teachers can create a comfortable environment for learning. There is an overwhelming joy that comes over me when standing in front of a group of students, knowing that someday they'll be dancers, engineers, political leaders, and doctors. Others will be plumbers, bakers, and chefs. They will go off into the world and discover marketing, graphic design, and research. They'll write poems, stories, and music. Some will play ball, some will play house, and some will play school, as teachers themselves. The constant in all of this is the relationship between a student and a teacher. It begins with a spark of creativity or a great question. Reinforcing that excitement with resources, opportunities, and support follows, knowing that at some point students will uncover their passions and work to achieve long-term goals.

This issue of *THP* presents many ways to interact and serve your students. In *SEE ME in STEM*, Tia Dolet and Brittany Anderson strongly advocate for programming that is informed by the multifaceted life experiences of a specific population and present recommendations aimed at addressing their needs. *Supporting Gifted Students in Writing Courses Through Visual Journaling*, by Peaches Hash, asks educators to consider activities

that allow for both challenge and emotional expression. Melinda Reay and Scott L. Hunsaker present an approach that successfully prepares students for writing in *Using Daily Writing Practice in Advanced Placement Courses* and Kathryn Brave and Amey Sanders ask us to consider the role that language plays in defining one's future in *Turning Over a New Leaf: Creative Wordplay in the ELA Classroom*. *Digital Ecosystem* tackles an unsettling topic and discusses ways educators can equip themselves with the tools needed to ensure online safety. *iMathination* presents the third installment related to problem posing. Establishing a culture that teaches students how to engage in rich conversations is the focus of *Making Curriculum Matter*. *Sparks of Innovation* speaks to naturally integrating innovation into your classroom, *Taking the Lead* offers advice for creating meaningful professional development in your school, and *Buried Under Books* highlights the need to pay attention to student reading behaviors and attitudes towards it. *The Scholar's Corner* looks to nature to understand the diversity of our student populations and *Unwrapping the Gifted* ponders the never-ending process of advocating for gifted and talented students and services.

Never doubt the effect you, and the educational setting you create, will have on your students. I've heard from many former students who speak to the work they completed in my classroom, where the invitation to give a speech, research a topic, conduct an experiment, organize a social event, serve the community, paint a picture, work together with others, and countless other opportunities grabbed hold, and never let go! I can't help but think that at some point they will be sharing the stories with their friends. I hope that they do, and I wish the same for you.

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Navigating Controversial Issues

Human trafficking is a global problem that impacts people of all genders, ages, nationalities, and backgrounds. According to the United Nations, human trafficking is the recruitment, transportation, transfer, harboring, or receipt of people through force, fraud, or deception, with the aim of exploiting them for profit (<https://www.unodc.org/unodc/en/human-Trafficking/Human-Trafficking.html>). In 2019, the National Human Trafficking Hotline was contacted over 22,000 times to open cases, with 5,359 of them being children under 18 years old. The growth of social media platforms has made it easier for human traffickers to build relationships with unsuspecting minors and recruit them into labor or commercial sex. According to Alyssa Currie Wheeler at the Human Trafficking Institute (<https://traffickinginstitute.org>), approximately 41% of all federal sex trafficking cases were recruited online. As educators, we have a responsibility to implement awareness and prevention programs. We must educate young people about how predators build relationships and trust through online platforms with the sole purpose of exploiting their victims. Teachers must educate students about the recruitment tactics of online human traffickers so that young people's digital ecosystems are free from predators.

Getting Started

The National Center on Safe Supportive Learning Environments (<https://safesupportivelearning.ed.gov/>) suggests that schools implement a community approach to human trafficking education and prevention. In 2021, the United States Department of Education published *What Schools Can Do to Prevent, Respond, and Help Students to Recover from Human Trafficking, 2nd Edition*. This resource helps educators to build awareness about the extent of human trafficking, inform students and adults about human trafficking indicators, and provide school-based prevention strategies.

Of note are the three prevention tiers and steps schools can take to address human trafficking. The Primary Tier focuses on prevention by training staff to notice signs of trafficking and to educate children about online safety. The Secondary Tier details how schools identify potential victims and respond to suspicion of trafficking. The Tertiary Tier helps schools to develop a plan for treatment and recovery. It is noted that providing trauma-informed care must be implemented with trained clinical professionals but that school officials should be part of the student care team.

3 Strands Global Foundation

The mission of the 3 Strands Global Foundation is to mo-

bilize communities to combat human trafficking through prevention education and reintegration program (<https://www.3strandsglobalfoundation.org/education>). The foundation's PROTECT curricula has prevention activities for grades K-12, training materials for adults, and reporting protocols to use when responding to suspicion of trafficking. The foundation believes that when the adults responsible for the education setting are knowledgeable about human trafficking and understand the concept of trauma-informed practices, they can more easily recognize and respond to the warning signs and save a child's life.

The PROTECT curriculum is available online and is best implemented after a 2-hour training offered by PROTECT staff. After the training, administrators will be able to implement the three prevention tiers in their schools that equip teachers, counselors, and school resource officers to prevent traffickers from engaging in the exploitation of children.

Protect Our Children

Protect Our Children (<https://projectprotectourchildren.com/>) is a non-profit organization that provides preventative education and direct services to teenage trafficking survivors. The program's three-word mantra, Engage, Education, and Empower, serves as the basis of their efforts to combat sex trafficking, exploitation, and abuse. They have developed an online directory of resources that offer emergency, transitional, and long-term services to victims and survivors of human trafficking. Their parent resource guide helps parents have conversations with their kids about online safety. The parent resource guide has tips for working with kids of all ages.

Human trafficking is a significant problem that is present in every community across the globe. Knowing the warning signs of online predators can save our children's lives. Equipping ourselves with tools and understanding how to approach difficult discussions about online safety is the first line of defense in our schools. **THP**

Practical Strategies for Fostering Mathematical Creativity—Part III

The third and final part in this series of articles will focus on **Problem Posing** as a strategy to support teachers design promising activities/tasks to foster creativity in mathematics classrooms (by the way, the focus of the first and second parts were open-ended tasks and mathematical modeling respectively). Problem posing is a type of inquiry-based teaching strategy that encourages students to ask their own questions about a concept or topic. Several researchers in mathematics education found that the process of problem posing helps students improve problem-solving abilities, conceptual knowledge, and particularly creative thinking in mathematics (English et al., 1997; Silver, 1994).

The act of identifying and formulating a problem, which is separate from and possibly more significant than problem solving, is a major part of creative thinking and creative performance in various domains (Jay & Perkins, 1997). Given that the problem posing process requires seeking out a problem, transforming of a given situation into a new version, and finally creation of a new problem (Silver, 1994), it also naturally taps students' creative thinking skills. When teachers use this strategy continuously in their daily teaching activities, posing/creating a problem turns out to be a habit/skill of mind for learners in the classroom. In her blog, Alane Starko (the author of the well-known creativity textbook, *Creativity in the Classroom: Schools of Curious Delight*) states that "problem posing mirrors the mathematical curiosity of mathematicians and helps students envision math as an environment for exploration rather than a never-ending series of calculations."

Although problem posing is a great strategy to foster mathematical creativity and problem-solving skills, it is never an easy task for teachers or students. Problem posing needs more than a simple modification of an existing problem or situation; becoming a good problem poser requires structured coaching and guidance. Teachers will notice shortly how their students will develop into expert problem posers when the students receive systematic coaching about their problem posing skills. As students advance in their skills in problem posing, their problems will shift from random variations to those with a distinct mathematical goal (Making Mathematics, 2002). Here are several resources that include wonderful strategies and examples of problem posing for educators:

1 Positioning Our Students as Problem-Posers by Chris Bolognese. In this blog, Chris introduces problem posing examples and gives tips about how teachers can get

started with having students pose their own problems. Further, he lists such nice ideas about using problem posing strategy as a tool for summative and formative assessments. <https://www.mathvalues.org/masterblog/positioning-our-students-as-problem-posers>

2 The Art of Problem Posing. This is a classic book co-authored by Stephen I. Brown and Marion I. Walter. In this book, Brown and Walter provide wonderful examples of effective problem posing practices for current and prospective teachers at the middle school, secondary school, and higher education levels to enhance their teaching, while presenting suggestions for how to incorporate problem posing into a standard mathematics curriculum. The book also addresses the role of problem posing in the NCTM Standards; elaborates on the concept of student as author and critic; includes discussion of computer applications to illustrate the potential of technology to enhance problem posing in the classroom; explores diversity/multiculturalism; and broadens discussion of writing as a classroom enterprise. Here is the link for the publisher of the book: <https://www.routledge.com/The-Art-of-Problem-Posing/Brown-Walter/p/book/9780805849776>

3 Problem Posing by The Making Mathematics Research Projects. The Making Mathematics Research Projects provide discussions and activities that will help educators and students expand their problem posing repertoire and promote the habit of creating new problems. You will also find a list of problem-generating strategies to change a problem to create new problems. Here is the link for their webpage about problem posing: <https://www2.edc.org/makingmath/handbook/Teacher/ProblemPosing/ProblemPosing.asp> **THP**

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The Art of Discussion

Facilitating classroom discussions and engaging students in academic discourse play a critical role in helping students process information and develop deeper conceptual understanding as they engage with content. By pre-planning specific goal-directed discussions about meaningful content, educators can help students transform their ideas, gain new perspective, and even challenge pre-existing ideas and misconceptions.

Engaging students in high-quality academic conversations requires thoughtful planning. Rich conversations are facilitated in the presence of expectations and boundaries that are explicitly discussed with students prior to their engagement. These norms guide students in using language that creates safety, support, and care for one another. Developing norms about how the group talks and listens to each other is critical in creating these safe environments. Asking students to consider what the difference is between a discussion and a debate and discussing the difference between feeling threatened in a conversation vs. respected can serve as a vehicle for building in students’ ideas and experiences into your norms for classroom discussions. Establishing a culture that teaches students how to engage in rich conversations and deep thinking can be enhanced in the following three ways.

Scaffolding Language. A part of having this explicit conversation with students may include discussing with them how partner or peer-to-peer interactions should “sound”, including how language can either encourage or shut down conversations through the use of words that are disrespect-

ful. Asking students to consider the types of language they might use when they disagree with an idea of a classmate, seek clarification of an idea, or even elaborate upon an idea that has been stated increases the likelihood that students will become more efficacious and willing to engage in conversation and discourse. Categorically discussing these language frames to scaffold and support students in their academic and conversational discussions helps to explicitly suggest ways of framing their collegial peer-to-peer exchanges. Conversation stems, like those below, can be placed strategically in the classroom, but more importantly should invite students to find ways to understand each other.

Using Routines for Thinking That Encourage Discourse. To assist students in the active engagement with content and academic discourse, the *Visible Thinking Routines* developed by Ritchhart, et al., (2011) provide educators with tools and routines to prompt and direct student thinking and structure student discussion as an approach to understanding. When the first Visible Thinking initiative was launched at Harvard’s Project Zero, researchers Dave Perkins, Shari Tishman, Ron Ritchhart, and others developed a number of important research products by studying how to cultivate thinking dispositions in schools. The one that is best known is the set of practices called Thinking Routines, which help make student thinking visible. These thinking routines guide strategic thinking and deepen students’ engagement as they learn to externalize their thoughts, ideas, and beliefs, and make visible their

continued on page 8

Conversation Stems	
Agreement: I would agree with the idea...and would add... I agree with the idea about...but would like to add... The point made about...was important because... I agree with the point about...because... My idea builds upon...’s idea in that...	Disagreement: I see the issue differently in that... I wonder if it is important to consider other factors to this argument about..., such as I have a different perspective on this issue...
Seeking Clarification: What did you mean when you mentioned...? Can you further explain what you meant by...? Would you explain your reasoning about this solution/idea? I am confused when you say...Can you elaborate on this idea? I have a question about that... How did you figure this out...	Posing of a Question/Offering a Suggestion: I was thinking about what ____ said and wondered if ____? The idea or claim that has been made is interesting because... If we all agree with the idea..., wouldn’t it also be true that... If this is the case, then... While I think this certainly speaks to the issue of...I wonder if we have considered the various stakeholders that will be affected by this?

Supporting Gifted Students in Writing Courses Through Visual Journaling

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Gifted students of all ages have cognitive and emotional needs that require purposeful curriculum design. Many students who are academically or creatively gifted rapidly process information, allowing them to think and feel more. Teachers of gifted students are tasked with creating curriculum that must both challenge students and provide them with opportunities to develop their academic and creative potential. However, because emotions interact with cognitive processes, if gifted students are not provided with opportunities to express their emotions, their learning may be negatively impacted. Gifted students are strongly aware of their emotions and sensitive to self-criticism and external stimuli; consequently, they may experience heightened levels of anxiety, depression, denied emotions, and overextension from stress. With these emotional influences on gifted students' learning, teachers should consider activities that allow for both challenge and emotional expression. An effective choice is visual journaling.

Benefits of Visual Journaling

Visual journaling is a method of art-making that combines alphabetic text and images to create a product. The activity can be based on a prompt, or more free form based on the user's choice. There are no requirements as to how many words or images to include, the materials used, or the size of the journal.

Traditionally, visual journaling is utilized as a method of reflection for personal practice or within psychological and educational settings; however, it can also be used to record thoughts on readings or research and construct ideas about a subject. In educational research, visual journaling can be a curricular method as well as a data source to view the effectiveness of a curricular technique. Regardless of the purpose of visual journaling, it always serves as a form of expression and knowledge construction (Hutchinson, 2018).

Visual journaling can support students academically, creatively, and emotionally. In her research on journaling with gifted students, Brown (2020) outlined multiple ways that traditional journaling can support student learning, including promoting reflection, articulating constructed knowledge, responding to stimuli, and organizing ideas. However, relying solely on alphabetic responses privileges one form of knowing that limits and excludes some students' voices based on preferred ways of articulating knowledge, as well as race and class. Furthermore, unlike assignments that rely only on alphabetic literacies, visual journaling can reveal nuanced and layered meanings of student responses as well as provide more clarity of thought (Hutchinson, 2018).

Visual journaling provides students with enhanced challenge and individualized learning. The combination of alpha-

betic text and visuals allows students to express their learning in innovative, multimodal, and nonlinear ways. Additionally, creative activities can promote deep thinking and alter fixed mindsets about one's strengths and capabilities. Hutchinson (2018) explained that visual journaling is challenging because it takes people "off of auto-pilot" (p. 1) by requiring them to connect stimuli with personal experiences, allowing for assignments to facilitate active learning processes of making and creating.

The creative nature of visual journaling helps foster innovation and expression in students. When interviewing multiple gifted educators on how teachers can support creatively gifted students, Alsamani (2020) found that teachers need a curricular balance, relinquishing control while providing some structure in assignments. Assignments should also attempt to increase intrinsic motivation, foster the development of skills and knowledge, and allow for individualized expression based on students' personalities. Visual journaling often includes prompts but encourages students to be self-guided in material selection, composition, and design. Creative activities such as visual journaling are a form of "self-education" where "simultaneous exploration of aesthetic alongside philosophical, affective and conceptual concerns" can occur (Harris, 2014, p. 70). Creative assignments do not have to focus on newness, but can center around

synthesis, allowing students to combine knowledge and skills in innovative ways (Kim, 2019). Visual journaling is a process of reflecting on one's experiences and examining overarching themes and concepts (Hutchinson, 2018). It can also spark creativity by allowing students to stabilize ideas to develop into larger projects (Hutchinson).

Aside from the academic and creative benefits, visual journaling provides more opportunities for expression than purely alphabetic text assignments permit. Art-making is a dynamic way of knowing that opens multiple opportunities for students to convey their emotions and reflect on their experiences. Free expression can facilitate mental health by instilling confidence in self-exploration and self-expression (Kim, 2019), while also offering opportunities for reflection that can have therapeutic experiences for students. According to Hutchinson (2018), visual journaling can facilitate mindfulness by "[making] us more conscious of what we are experiencing" as well as "[increasing] self-awareness and [boosting] our own emotional intelligence" (p. 59) to record, review, and observe personal growth.

Visual Journaling in the Honors Writing Course

Brown (2020) offered many ways that teachers could integrate journaling into curriculum such as self-reflection, setting and achieving goals, creative expression, imagination, response to stimuli, organization of ideas, and tracking thoughts and feelings over time. Visual journaling can function in all the ways Brown outlined but is a more inclusive and creatively challenging activity for gifted students than traditional journaling. Students have opportunities for choice in multimodal activities; and in an already-established curriculum, visual journaling can serve as a response to texts within curricula, as well as to assignments to help support student learning.

Students in my undergraduate honors writing course were asked to respond to a reading within our textbook. One student chose to create puzzle pieces that connected together to form a unified whole, but each piece also had many images inside of it that represented an aspect of the whole (see Figure 1). His

art showcased both the complexity of the reading as well as how the reading's content connected in his mind. In the student's explanation, he stated that he found the reading "slightly confusing and overwhelming" but the visual journal allowed him to separate the main ideas in a way that made sense to him. I would not have necessarily known he found the reading overwhelming without his written reflection, but his art allowed me to see nuanced details of the reading that he may have summarized or omitted if he only used alphabetic text. He also wrote in his response that he appreciated the ability to go back and look at his images in the future if he needed clarification of terms. He also liked that he could choose to create what he described as "silly images" to be playful with the assignment to relieve some stress.

Figure 1. Student visual journal reading response



Figure 2 is from a student within the same course as the artist from Figure 1. This visual journal assignment asked students to reflect on their first major writing assignment. Whereas my goal in the first visual journal assignment was to view constructed knowledge from an assigned reading, this assignment was an opportunity for students to reflect on their writing process and express their emotions. In her writ-

ten response, this student explained that she felt "various emotions" over the course of writing her paper and completing the multimodal aspect. Her art depicted feelings of being "tired," "excited," and "appreciative" of the alone time the assignment afforded her. She wanted to articulate a "suspended feeling of coziness" while art-making for the assignment, combined with feeling "stumped" at times and "drowning" in stress. The blue lines covering the image represent her emotions. In the end, she stated that she was comfortable with the feeling that she had room to grow, but also satisfied with the outcome. This activity enabled me to see the various emotions that the student felt, as well as her process of feeling them; the extent to which she felt them; and where she was by the end. This activity had a more therapeutic effect on students, allowing for complete emotional expression that connected to an assignment.

Although I teach undergraduate writing courses, both of these activities could be utilized in K-12 settings. The National Association for Gifted Children's (2019) programming standards include self-understanding, diversity, inquiry, and metacognitive aspects, which visual journaling can support academically, creatively, and emotionally. Teachers may implement visual journaling as a response to readings or reflective activities and can consider how visual journaling may enhance an already-established curriculum or spark new curriculum development. Additionally, students could complete visual journaling activities in-class or outside of class depending on students' access to materials and time blocked in the curriculum.

Figure 2. Student visual journal paper reflection



Conclusion

Although art-making activities are sometimes stereotyped as nonessential to learning, it is important to remember that “[w]e are biologically wired to be visual,” with “[m]ore than 50 percent of the cortex [...] devoted to processing visual information” (Hutchinson, 2018, p. 2). Art-making activities such as visual journaling are fun and engaging, but they are also cognitively and socially inclusive for gifted students. Visual journaling can also support gifted students academically, creatively, and emotionally, making this curricular technique a highly beneficial strategy. To get started, there are also many helpful texts such as Hutchinson’s (2018) *The Simple Guide to Visual*

Journaling (Even if You Aren’t an Artist) or Ganim and Fox’s (1999) *Visual Journaling: Going Deeper Than Words*. There is no one-size fits all approach to using visual journaling in educational settings, but there are many ways it can enhance curriculum, as well as many benefits for gifted learners. **THP**

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making curriculum matter

continued from page 5

thinking processes as they develop deeper connections with the content under investigation.

As we engage professionally with our colleagues in conversations that increase student talk, thinking, and peer-to-peer interactions, spending time collectively reading texts such as *Making Thinking Visible: How to Promote Engagement, Understanding, and Independence for All Learners* (Ritchhart et al., 2011) and putting into use the thinking routines found on the website called *Project Zero’s Thinking Routine Toolbox* (<http://www.pz.harvard.edu/thinking-routines>) can only complement the work that we do as curriculum planners and promoters of student understanding.

The Importance of Capturing Student Voice in Discussion and Thinking. It becomes critically important to consider all the ways that we can capture student voice in all the various ways in which it can be represented. To send a message to students that their voices matter as we engage in compelling curricular discussions, it is important to recognize that not all students will feel secure in expressing their ideas freely due to language, power, personal perception of self-expression and identity, and disability. Along with the use of digital voice and video tools, we can provide students opportunities to explain their thinking without the barrier of knowing how to compose the perfect grammatically correct paragraph to ensure that every voice is heard and to provide a safe space for those students who remain quite shy and reluctant in expressing their thoughts in a crowd. To accomplish this, educators can use collaborative boards, such as *Padlet* (<https://padlet.com>) which fosters collaboration, *Book Creator* (<https://bookcreator.com>), where students create interactive journals using text, voice-to-text, audio, video, and drawing, *Flipgrid* (<https://info.flip.com>) to set up discussion groups or thinking prompts and *Flipboard* (<https://flipboard.com/>) or *Google Docs Voice Typing* that allows students to “crowdsource” information as students collectively come together to share information.

Academic conversations, discussions, talk moves, and routines all help to increase the likelihood that students will engage in meaningful interactions and work together to co-construct knowledge. These discussions help all students develop reasoning skills and foster a culture of valuing different perspectives and diverse ways of thinking. **THP**

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Teaching Innovation in Your Middle School Classroom

When we consider innovation, the image of Walt Disney comes to mind. Disney was an innovator; he took well-known stories and used them to launch Disneyland and Walt Disney World. Disney had a brilliant conception for both projects, but he didn't start from point zero. To create these theme parks, Disney used traditional fairy tales as a launching point for rides and attractions.

As a teacher, you don't have to start from point zero either. Innovation can be naturally integrated into your classroom, regardless of which subjects you teach.

Perhaps the best way to introduce innovation is by having a class discussion. Many students have visited a local amusement park. Begin with an open-ended statement:

Imagine that you work at a theme park, and you are assigned to develop an additional ride or attraction to add to the park. What will you develop, and how will this new attraction enhance the quality of the amusement park?

Students will enjoy brainstorming idea together. During this initial process, let students express ideas without worrying about their feasibility. Write down the ideas on the board, and wait to see what happens next.

Following this introductory activity, students can begin by studying individual theme parks, accessing park maps, and looking for needs within the park. A great resource is Jason Surrrell's *The Haunted Mansion: Imagineering a Disney Classic*. Students will see how this ride was conceptualized, developed, and built at Disney World. This book can serve as a model in developing student's own theme park ride.

Once students have developed an idea, have them draw a picture of it. Students can elaborate by describing the ride with vivid details. Many students will use traditional stories to create a new ride, but you may want to encourage them to develop new storylines around their project. After students finish designing their projects, they can work on presentations meant to "sell" it to the class. As theme park innovators, students will enjoy the process of coming up with a new addition to an existing theme park. As an educator, you can be a facilitator and inspiration to your students. During this entire process, your class will become a community of learners and innovators.

What you do next is up to you. No matter which direction you take this exercise in, you will lead your students through a remarkable educational experience. Below is a sample assignment I have used but feel free to modify it.

Theme Park Innovator Assignment

Your job is to imagine a new addition to an existing theme

park. Think about how you will present your ideas to park executives.

This is what you will need.

- 1. Title / Name** – (i.e. Cinderella's Ride: A Proposal for the Walt Disney Company)
- 2. Introduction** – An introductory statement explaining where the addition will be in the theme park, why you have developed this addition, and how the it will enhance the park's overall appeal.
- 3. Description** – Describe the new ride. What do people see and experience during your ride? How the original storyline inspires your ride, and the overall visual experience? Include a picture of the addition.
- 4. Design of ride/addition** – Think about the logistics of how the ride will be designed, etc. Consider where the ride/addition will be placed in the theme park.
- 5. Background information about the ride** – Consider the underlying story behind the ride, and how it works within the larger theme park. If it is Cinderella's Ride, describe how the ride complements Disney's movie, books, and products. Students may reread the Disney version of "Cinderella" as they create their ride.
- 6. Conclusion** – Write a statement about why your ride will be a good addition to the park. This is your last chance to state your case, so write a compelling one.

This outline is a blueprint for what you may decide to do. While I have used Disney World to simplify this exercise, feel free to allow your students to develop a ride that fits into any theme park in the world. You may modify, add your own rubric, and make this assignment your own.

Finally, reconvene your class to discuss what you have learned together. As theme park innovators, your students have created rides that will appeal to wide audiences while gaining valuable knowledge about innovation.

You touch the future every day. Using this assignment, you can teach innovation, creativity, teamwork, public speaking, and other valuable skills to your students. Children will enjoy working as theme park developers for the day, and they may indeed be inspired to pursue a creative career in the future. **THP**

Resource

Surrrell, J. (2015). *The haunted mansion: Imagineering a Disney classic*. Disney Editions.

There's Never Enough Time to Plan for Professional Development

As a school leader, it is my responsibility to value my teachers' time and provide them with meaningful ways to enhance their teaching craft. One of the things that drew me to administration was the ability and opportunity to provide professional development. Little did I know that the time I always wanted to put towards planning professional development was often superseded by day-to-day emergencies that needed immediate attention. I would find myself scrambling during the week of an in-service or early release day to find or try to create meaningful professional development.

In November of 2015 the National Association for Gifted Children Talent Development Task Force published a report to the Board of Directors. Within this report, the task force identified the need to reorganize the focus on talent development. The Task Force was able to determine how key beliefs and practices in the field of gifted and talented education might be viewed through a talent development lens (Talent Development Task Force, 2015). Professional development was one of the lenses considered as a way to implement a mindset shift towards talent development. Professional development is a way to help shift and inform participants' knowledge, attitudes, and practices.

The Task Force identified five topics as necessary components for preparing all educators to better understand and utilize Talent Development:

- 1 The areas of developmentally appropriate, domain-specific identification strategies
- 2 Variety of program and service options to meet specific needs of gifted students with a variety of abilities and interests and who are at different points along a talent development pathway
- 3 Comprehensive, aligned curriculum for gifted learners that is differentiated to challenge individuals in their areas of gifts and talents
- 4 Provisions that support social-emotional well-being and affective growth
- 5 Creating environments and providing learning opportunities that promote academic achievement and creative productivity.

Let us take a closer look at three of these topics and explore some ideas and tools for planning and implementing these ideas.

Understanding developmentally appropriate, domain-specific identification strategies

Not all students who need access to talent development are easy to spot. Providing professional development around the specific needs and developmental needs of gifted learners is always a helpful and eye opening activity.

• Professional Development Idea:

- Read *Profiles of the Gifted and Talented* by George T. Betts and Maureen Neihart. Betts and Neihart developed six profiles of gifted and talented students. Have participants create student profiles for a student they may have worked with for each different profile type. Allowing participants to apply their own work to research makes the connection from theory to practice. (URL: https://www.researchgate.net/publication/240729625_Profiles_of_the_Gifted_and_Talented)

Providing comprehensive, aligned curriculum for gifted learners that is differentiated to challenge individuals in their areas of gifts and talents

Differentiation is a philosophy I like to routinely review with teaching staff. Even as a seasoned educator, I feel like every time I engage with differentiation materials I am always able to take away a new implementation idea. As the guru of differentiation, Carol Ann Tomilson, says, "teaching is a marathon, not a sprint."

• Professional Development Idea:

- I enjoy using a short clip of Carol Ann Tomilson discussing how to get started with differentiation (<https://www.youtube.com/watch?v=LGYa6ZacUTM&t=1s>). While viewing the clip, have participants record 5 takeaways. Teachers can then share and discuss these within departments or grade levels.
- Use the experts you have in your school! Build leadership within your building by asking a teacher to share how they utilize differentiation within their classroom.

Utilizing provisions that support social-emotional well-being and affective growth

Many teachers agree that social-emotional learning is interwoven with academic skills; teaching without addressing a student's social and emotional readiness could result in less growth. Understanding the whole child is an important aspect to fully reaching a child's potential.

• Professional Development Idea:

continued on page 15

The Science of Reading is for Everyone

A few months ago, Emily Hanford, American Public Media (APM) Senior Producer and Correspondent, launched a new series named *Sold a Story: How Teaching Kids to Read Went So Wrong* on the Educate Podcast (<https://www.apmreports.org/collection/educate-podcast>). This series is an extension of the literacy education investigation that Hanford has been researching for years. My first encounter with Hanford's work was in 2018 with the podcast, *Hard Words: Why Aren't Kids Being Taught to Read?* (<https://www.apmreports.org/episode/2018/09/10/hard-words-why-american-kids-arent-being-taught-to-read>). She was talking my language and I was hooked on listening to her work on the flawed ways that young people are taught to read.

When I began teaching in the mid 1980s, I was unprepared to teach students how to read. I had some basic knowledge of literacy but it was not extensive enough to help students who might not identify patterns in how sounds are represented by letters. I did not know some of the basic terms of alphabetic principles. I knew how to read and write and for some reason I thought that might be enough to teach students. I loved books and quickly developed a reputation for sharing them with my 2nd and 3rd graders. In my first few years of teaching, many of the students in my classroom had literacy rich backgrounds with access to books, had parents who valued reading and were able to learn to read with instruction that may not have been as effective as it could have been. Over the years I encountered more and more students who were not able to read fluently and who struggled with comprehension. This included students who were identified for the gifted and talented programs who often had large sight vocabularies but did not have word identification skills to decode words encountered in print for the first time. How could these students who had abilities and access to books not know how to read decodable words (words that follow the patterns of letters and sounds)?

I started to question the methods and materials that were being used to teach students to read. How did the picture help a student decode a word? How might I teach students to read in a more explicit and systematic way? These questions haunted me but in truth I was focused on other areas of education including meeting the needs of students who were identified as gifted and talented, researching the characteristics and methods to teach talented readers, and developing curriculum strategies to escalate English/Language Arts curriculum. Fast forward to now. I teach literacy courses for teacher candidates and courses in an advanced master's program for certified teachers. I have spent most of my career as a professor learning how people learn to read and teaching students about the

big ideas in reading development: phonological awareness, alphabetic principle, fluency, vocabulary, and comprehension. I am also a big fan of literature for youth and read and share hundreds of books in my courses, at conferences and events, and on social media.

This is not a debate. Many students do not learn to read without systematic and explicit instruction in how letters make words. In fact, it is likely that 5-10% of the population learns to read without effort and another 25-40% learn to read with reasonable instruction. That means that 50% of the population needs systematic and explicit instruction. This includes students who have been identified as gifted and talented and those who are Twice-Exceptional (2e) and may have difficulty with the printed word but also have strong abilities in non-reading related areas.

We are not wired to read in the same way that we are wired for listening and speaking. It is not reasonable or accurate to assume that all students will learn without instruction. As you work with students who are identified for gifted and talented services, pay attention to their reading behaviors and attitudes towards reading. While these students may be able to read and comprehend at or above what you would expect for a child of that age, it is also possible that they may benefit from instruction to help them read more effectively.

Here are questions to keep in mind as you consider whether students have the skills and strategies to be lifelong readers:

- Does the student want to read? Avoid reading?
- Does the student identify and generate rhymes?
- Does the student look forward to hearing books read?
- Does the student have the ability to decode words that they see in print from the first time?
- Does the student read fluently with accuracy, rate, and prosody?
- Does the student have the Tier II (high frequency and multiple meaning words in a variety of domains) and Tier III (content specific) vocabulary they need to create meaning from text?
- Does the student read diversely and across multiple genres?
- Does the student demonstrate literal and inferential comprehension?
- Does the student have the schema they need to read both fiction and nonfiction?

For an overview of information about the big ideas in reading visit

continued on page 22

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Using Daily Writing Practice in Advanced Placement Courses

In addition to a high grading weight, Advanced Placement (AP) courses emphasize on writing skills throughout the curriculum. In fact, 60% of the exam weight in my course, AP U.S. History, relies on some sort of writing skill. A student's ability to pass the AP test is therefore reliant on successful writing. There are often instances in which students had relatively low recall and analysis of history, yet managed a commendable passing score on the exam due to their writing skills. On the other hand, a student with exemplary recall and historical analysis fails the exam due to lack of ability in writing—what many would say is the more heartbreaking situation.

Instructional Reports are provided to teachers by College Board in July following the year's AP exams. These reports are subject-specific and include a group pass rate for a teacher's students. They also compare a teacher's students against the state and global averages in various areas. Teachers can find how their students compared to others in different areas, like theme, question type, criteria on the scoring rubric, topics, and skills. Teachers can use these reports to find gaps in their teaching and to identify student strengths and weakness by making these comparisons.

Good classroom assessment is systematic and continuous. Good teachers use assessment information to determine adjustments they need to make

to their own teaching, as well as interventions needed to give students opportunities for continued growth. Based on my own analysis of the assessment information provided by College Board, I developed a systematic approach that I called Daily Writing Practice (DWP) that helps me reflect on my own teaching, as well as to prepare my students for writing about history.

Analyzing Instructional Reports

As a first year Advance Placement U.S. History teacher, I focused on teaching the material. Imagine my surprise when feedback I received from the Instructional Report was released. I was below average on several rubric categories for essay writing. While my pass rate showed that my students knew the material, a breakdown of my scores in writing showed a lack of awareness on my own part of the need to explicitly teach and reinforce writing skills. I knew I had to create and implement a system in which I could target instruction, differentiate for students, and help them see their own progress readily. Thus, DWP was born. The Free-Response section can particularly help drive instruction and guide me in the creation of DWP activities. In the Free-Response section, a teacher can see their group's overall average on each of the free-response essay types. In addition, it breaks down each portion of the rubric for different types of essays to

show deficits in students' performance. Thus, the Instructional Report can be used by educators to help target areas of weakness in their students as well as with their own teaching.

When I first began analyzing the Free-Response Section of the Instructional Report, I noticed that my areas of weakness in teaching were in contextualization and the creation of thesis statements. In addition, I noticed that out of the three major skills in my course (i.e., causation; continuity and change over time; comparison), I struggled the most with comparison. With this analysis, I knew where to target my DWP activities—on the skills of contextualization, creation of thesis statements, and comparison, while not forgetting other skills and content.

Creation of a DWP

Now that I was using the Instructional Report to determine my own weaknesses, I began planning my DWP activities. Planning a DWP activity consists of three elements: 1) identification of a deficit, targeted skill, or overall concept; 2) developing a scaled writing prompt and 3) evaluating the student's writing response. The deficit, targeted skill, or overall concept is identified using the Instructional Report as exemplified in the previous section. Writing prompts are scaled so that students progressively move through a series of writing exer-

Figure 1. Sample Daily Writing Activity Prompts: American Colonization

Reasoning Skill: Comparison Essay Prompt Style: Short Answer Question
DAY 1 Prompt Answer each of the following questions in at least 3 sentences each, labeling each response with the letter shown below: - What is one similarity that you noticed between colonization efforts of the Spanish and French? - What is one difference that you noticed between colonization efforts of the Spanish and French? - Choose one of the above and explain what effect that similarity or difference had on the Americas or colonizers.
DAY 2 Prompt Using each option given below, create a similar/difference (compare/contrast) statement (1 sentence long) using the following as a sentence stem: "While _____ and _____ are similar because _____, they are different because _____." This also had an impact in the fact that _____. - New England Colonies versus Southern Colonies - New England Colonies versus Middle Colonies - Chesapeake Colonies versus Southern Colonies
DAY 3 Prompt Answer (a), (b), and (c). Confine your response to the period from 1500 to 1750. - Briefly describe ONE specific historical difference between the role of religion in Spanish colonization and the colonization of New England. - Briefly describe ONE specific historical similarity between the role of religion in Spanish colonization and in the colonization of New England. - Briefly explain ONE specific historical effect of religion on the development of society in either the Spanish colonies or the New England colonies

cises, with the student able to complete AP exam formatted writing prompts as the final step

The implementation of DWPs goes in a three-step progression, with one step taken each day. The progression is extended beyond three days when skills are not met such as when students continue to make similar mistakes even after feedback is given, or class-wide errors are found. Teachers may also skip through progressions, or revert through the progression, depending on classroom progress or acceleration needs. This is the progression of steps:

- **Stage 1/Day 1:** On the first day of addressing the deficit, targeted skill, or overall concept, the wording of the prompt is simplistic and easy to understand with at-level vocabulary. While the writing is simplistic, ensure that it still addresses a specifically aligned skill or concept from the AP curriculum.

- **Stage 2/Day 2:** On the second day, the wording of the prompt becomes more refined. Now, rather than simply asking for recall of information, the student is asked to begin to analyze history

in some way.

- **Stage 3/Day 3:** On the third day, the wording of the prompt becomes refined to the level of the AP exam. Students are asked to perform the specific skill or task required of a prompt they could see on the actual exam. This is also a perfect time to introduce actual AP questions, as long as the ones used adhere to the security guidelines from the College Board.

DWP in Action

With the basics of creating a DWP outlined, we'll look at real-life applications that were implemented in my classroom. The example shown in Figure 1 was inspired by two goals I developed based on my Instructional Report. First, I wanted to practice comparison essays, which my report stated were average in relation to the state and global results. Second, I wanted students to practice for the Short Answer Questions on the AP exam. Notice the general progression in addressing the two goals. Students began on Day 1 by using student-friendly words to analyze similarities and differences. Students progressed through Day 2 by

formulating answers at a higher level. The most important day, Day 3, required students to take the skills learned in the first two days to formulate a response to an AP-style question that came directly from the 2018 AP exam.

Figure 2 provides an example of a sequence of prompts with a different focus. The inspiration for this focus came from low scores on my Instructional Score Report on the Document-Based Question. The prompts were aimed to address three different points on the AP's seven-point exam rubric. Notice again the general progression through the various steps. Day 1 helped students begin thinking about causation and primary source use. Day 2 required students to use a provided source and analyze its relationship to a question. Finally, Day 3 required students to actually apply their skills and write similarly to the exam.

Grading Student DWP Responses

DWP activities help students identify their weaknesses and strengths relative to specific writing skills required for an AP exam. By using a proficiency scale for grading, such as the one shown here,

Figure 2. Sample Daily Writing Activity Prompts: Slavery and the Civil War

Reasoning Skills: Sourcing and Situation, Claims and Evidence in Sources, and Argumentation Essay Prompt Style: Document-Based Question
DAY 1 Prompt In a few sentences, explain how slavery eventually led to the Civil War. List and explain how one primary source document would support your answer.
DAY 2 Prompt Using the document above, identify, define, and explain how it answers the question: How did slavery help cause the Civil War? Then, explain the document’s context, intended audience, purpose, or point of view.
DAY 3 Prompt Using the following essay prompt and the document shown, create a body paragraph that includes all portions of the exam rubric (Evidence 1 and 2, Analysis 1): <i>Evaluate the extent to which debates over slavery in the period of 1830 to 1860 led the United States into civil war.</i>

students can understand if they are at, below, or above expectation for a passing score on the exam.

Ultimately, DWP activities require a three-part response similar to the AP exam itself. As shown in Figure 3, students receive one point for attempting the activity, with the other three points being awarded based on the AP History Rubric criteria. This process lends itself easily to some of the proficiency-based grading systems now being used in many school districts. The terms I used in my scale were drawn from those employed in my school district and state.

Students can easily relate this scale to actual exam questions. Additionally, combinations of various rubrics points from the College Board that are used during grading can also be assessed using the same four-point scale. For example, suppose, during a Stage 3 DWP, students are asked to write a body paragraph in a Long Essay Question (see Figure 2). Students may be asked to include all parts of their body paragraph, including identifying the document (Evidence Point 1), supporting the argument of the essay (Evidence Point 2), and analyzing the document itself (Analysis Point 1). Stu-

dents’ responses are graded using the DWP four-point scale, giving one point for each portion of the rubric earned, with the first point being the attempt itself. This same process is done at each stage.

Many Stage 3 prompts are actual exam questions from prior years. In cases like this, I always share with students the group, state, and global averages following DWP grading to see how they would compare on the actual exam. Comparing scores on questions, whether they are prior exam questions or teacher created, to these averages will also help students understand where they are in preparation for the exam. Using the information, students improve each day by benefiting from the opportunity to redo or reassess their DWP submission in order to fix any issues that may have occurred.

Educators also benefit from improving their own instruction based on the DWP results. For example, prior to the beginning of the school year, educators can use the Instructional Report to find their own deficits and target them during instruction. Creating DWP activities that target those skills allows the teacher to improve. During the school year, grading DWP submissions allows educators to identify class- or subject-wide issues that can be readdressed, rescaffolded, or adjusted to improve student scores and abilities.

These assignments also allow educators to differentiate instruction. Thus, using data from a DWP activity, differentiation assists both students who are achieving or struggling on a specific

Figure 3. DWP Proficiency Scale

Scale	Proficiency	Level Description
4	Highly Proficient	Student attempted and received all points possible from the targeted criteria on the AP History Rubric (likely would achieve a higher score on the AP exam).
3	Proficient	Student attempted the response and received some points but would not have achieved a perfect score for all criteria assessed (equivalent to a 3 on the AP exam).
2	Approaching Proficient	Student attempted the response and was on the correct path to proficiency, but still had deficiencies on the criteria.
1	Below Proficient	Student attempted the response but would not have received any credit on the criteria being assessed.

concept. For example, if students are excelling at the concepts, teachers can accelerate their instruction or move on to different skills. However, if an individual class or student is still struggling on the same issue, teachers can go to earlier scaled prompts to help students understand the basics.

Final Thoughts

My students clearly understood the purpose of DWPs. One student summed it up by saying,

I believe that we do DWPs in order to practice our writing skills for the AP exam. This could be done by either doing practice essay topics or identifying documents to ensure that we retained the necessary information from our lecture. They could also be used to help us identify any topics that might need to be revised if there was a particular DWP that a student struggled with.

Another student showed how these practice skills are needed for the exam

by explaining that DWPs are “to practice thinking about what types of questions could be on the exam, and to gain a greater understanding of the subjects through critical thinking without having to do an entire essay”.

Students have reacted positively to DWPs. One student said that “they have positively helped me because I feel like it gives me constructive feedback so I can fix what I get wrong. Instead of just saying it’s wrong, it helps me understand why”. Scaled activities have helped another student who noted, “the DWPs help to break down the AP test into more doable parts. It makes me a better writer for my essays and makes it easier to complete my essays”. Another student felt that, “they have helped increase confidence in my ability to write [Document Based Questions] and other essays. They are an easy way to get feedback on parts of essay writing that I might be struggling with”.

DWP activities help students practice writing skills on a daily basis using skill-specific prompts and, often, actual

exam questions to prepare for their future AP exam. Scaffolding during the process allows students to learn, use, and apply skills. Educators can use these activities on a daily basis to help students understand their own proficiency and preparedness for the AP exam, while also helping the educators themselves identify deficits in their teaching or in individual students. This allows for differentiated instruction based on the feedback from these assignments.

While the examples used here relate to AP History subjects, DWP can be integrated into multiple classes. For example, teachers in AP Human Geography, Government, Psychology, Math, and Science have used or adapted these procedures. Further, this integration can be applied in any course, AP or non-AP, that includes free response or essay questions. **THP**

¹Any use of first-person pronouns in this article refers to Ms. Reay’s experience as an AP teacher.

taking the lead

continued from page 10

- The Virginia Department of Education has put out a very useful handout with great resources for professional development (https://bestpracticesclearinghouse.ed.gov/docs/ResourcesLibrary_PDF/ED23-39f.pdf). This handout could serve as the backbone on a productive SEL professional development session.
 - Create a padlet board with the Essential Questions for Educators and School Staff.
 - Have participants pick a strategy or tool that they could implement in an upcoming lesson and share how they are intertwining these tools with content.
- Harvard’s Graduate School of Education has a digital publication, Usable Knowledge, that was founded for the sole purpose of connecting research to practice. This is a great resource for making research accessible to a wide audience. Usable Knowledge published an article about the importance of teaching and embedding social and emotional skills in the classroom (<https://www.gse.harvard.edu/news/uk/19/01/teaching-social-and-emotional-skills-all-day>). This resource highlights six different approaches to embedding SEL skills into the classroom.

As you look to create meaningful professional development for your school community, it is important to ensure you are

reaching the needs of your own staff. A simple needs assessment is always a useful tool prior to presenting. This will allow you to gauge the comfort levels your staff has with a presented topic. By providing a more personalized approach, you are showing that you value your colleagues time and knowledge. I hope the tools and resources are helpful in your ongoing professional development opportunities. **THP**

Reference

Talent Development Task Force. (2015). *National Association for Gifted Children Talent Development Task Force report to the board of directors*. NAGC.

Write for THP

Do you have practical classroom applications of current research, theory, and best practices in the field of gifted education? Are you proud of the innovative way you address the needs of gifted students in your school or classroom? Have you created a successful lesson or unit plan that aligns with the revised NAGC Pre-K-Grade 12 Gifted Programming Standards? If so, we want to hear from you! Send manuscripts to: Jeff Danielian, Editor, THP at jdanielian@nagc.org.

status. Intersectionality theory allows us to move beyond surface conversations around identity, providing a framework for critical dialogue(s) surpassing superficial awareness of underrepresentation.

Despite their level of involvement, the unique experiences of Black girls are often an afterthought, and not given focused attention when disaggregating the data, unless designed for Black girls. As we prime pathways for STEM careers and development—schools, educators, families, and other stakeholders must actively center on the needs and challenges of Black girls.

Advancing Equity in Gifted STEM Education

Decades of data show a historical underrepresentation of Black students in gifted education programs. Recent local, state, and national initiatives have been implemented to provide more equitable access to gifted education programs, including providing more culturally competent measures during identification screening. Even so, national data reveals that students' overall access to gifted courses does not necessarily result in equitable enrollment. The U.S. Department of Education (2016) found that even though Black and Latinx students make up 42 percent of the student enrollment for schools where gifted programming is offered, they account for only 28 percent of the program's enrollment. Additionally, while high-poverty schools were about as likely as low-poverty schools to have gifted education programs, students in low-poverty schools enrolled in gifted programs at double the rate creating what the researchers called a "Gifted Gap", especially amongst students of color in high-poverty schools (Yaluma & Tyner, 2018).

Not only have Black and Latinx students been historically underserved and overlooked for gifted programming, they also encounter accessibility challenges to rigorous STEM coursework. In comparison to all U.S. public high schools, schools with high Black and Latinx student populations had less access to intermediate and advanced level STEM courses. Emphasizing the lack of

advanced STEM courses available to students of color, a 2016 press release from the U.S. Department of Education reported that only 33 percent of high schools with majority Black and Latinx populations offered Calculus, in comparison to 56 percent of majority White or Asian schools.

Gender Gaps in STEM Education and Career Exploration

When it comes to the perceived achievement gender gap in STEM courses, longitudinal National Assessment of Educational Progress (NAEP) data show that for decades, a gender proficiency gap in STEM subjects has been virtually non-existent. In the exploration of why girls perform on par with boys in K-12 STEM classes but are later underrepresented in STEM undergraduate majors and careers, the theme of gendered stereotype threat is often referenced. Under this concept, girls and women in STEM struggle to feel a sense of belonging in their workplaces/educational settings and as a result, begin to doubt their abilities and question their situational belonging. Investigating the intended majors of high school seniors preparing for STEM careers, Weeden et al. (2020) found a pronounced gender disparity resulting from gendered attitudes about STEM occupations/majors, resulting in more boys' desire to enter biomedical or computer-based jobs compared to girls' nursing and healthcare preference.

This gendered gap in attitudes results in a STEM workforce where men overwhelmingly dominate the computer science field (Funk & Palmer, 2018). A recent study found that in school districts where boys outperformed girls in mathematics, gender employment and income gaps were also present (Rear-don et al., 2018). This suggests a social norm of preparing boys for high paying STEM jobs. Because girls, especially Black girls and other girls of color, are dissuaded and locked out of high-earning STEM fields, the existing economic inequities grow. Black women in STEM careers earn 87 percent of their White female counterparts' salaries and 62 percent of the salaries of White men in

STEM careers (Funk & Palmer).

Opportunities to Engage Gifted Black Girls in STEM Education through Extracurricular Programming

Using intersectionality theory as a framework, Collins (2018) found that gendered Black student STEM identities influenced Black girls' motivation to pursue STEM courses that would lead to careers in STEM fields. They questioned if they belonged in those fields; if they could/wanted to succeed in those areas; and whether they could accept the level of assimilation required to do so. However, researchers are, and have been, uncovering wonderful opportunities to engage gifted Black girls in STEM education.

Black women/girls' underrepresentation in STEM is particularly noticeable in the computer sciences. Detroit, a city where the majority of public school students come from low-income Black households, is also home to one of the few districts in the nation where girls consistently outperform boys in math (Miller & Quealy, 2018). To harness this untapped talent, Lawrence Technological University in Southfield, Michigan recently announced a partnership with the non-profit organization Black Girls Code's Detroit chapter to encourage girls to pursue STEM careers in engineering and computer sciences. Partnerships that result in extracurricular programming specifically designed to expose Black girls to STEM education can help GBGs excel in those fields and develop positive STEM identities by making the invisible visible—creating spaces for STEM exploration with role models and other girls who look like them.

Redefining the Narrative: Recommendations and Benefits of University-School-Community Partnerships

Considering that out-of-school STEM programming through University-School-Community (USC) partnerships have been spaces for talent development for GBGs, families, educators, and community leaders should engage with

these entities in collective, mutually beneficial capacities. These STEM spaces can redefine the narrative about GBGs and how they see their STEM identities. When we speak of redefining the narrative, we mean disrupting the stereotypical framing and imagery that has overcast the brilliance of Black girls in formal educational spaces. Out-of-school science programs, like Black Girls Code, increase the inclusiveness and accessibility of STEM education. This type of targeted programming also supports young people's acquisition of STEM skills and assists them in making critical connec-

tions between science and the practical world around them, while influencing their overall views of the science field. For Black girls in particular, out-of-school STEM education provides an opportunity for participants and practitioners to challenge dominant ideologies not only about who engages in STEM education, but also creates a space where common behaviors of GBGs can be reframed (Anderson, 2020).

Incorporating the expansive funding and resources of colleges and universities, USC partnerships can help close equity gaps in STEM education on larger,

more sustainable levels. Studies support that USC partnerships have successfully created pathways for underrepresented student populations to enter STEM college majors and have been instrumental in increasing the graduation rates of Black students in STEM undergraduate and doctoral degree programs (Packard, 2012; Stolle-McAllister, 2011). In these out-of-school environments, Black girls have been able to engage in authentic learning and shift the stereotype threat that may be present in formal educational spaces. The unique camaraderie of peer-supported groups of Black women

Table 1. Reframing Behaviors of University-School-Community STEM Engagement for Gifted Black Girls

Identified Behaviors	Reframe as...	Facilitator's Action
Challenge authority or too assertive	Reasoning, inquiry, leadership, takes risks to explore intellectual curiosity	-Acknowledge the comments, and situate yourself to “hear”, validate, and address the position of the student without being defensive -Acknowledge the creation of new learning and positionality as a leader and thinker in the content -Encourage student to continue to think independently and critically question material and positions on topics given their funds of knowledge and experiences -Listen for valid comments and reframe question(s) or position(s) if necessary, demonstrating to the student that learning is flexible and can be adapted
Loud voices, verve, calling out	Active participation, motivation, curiosity, interest-driven	Create space where various styles of STEM learning, language, and engagement can manifest
Exhibits perfectionistic tendencies	Reposition the environment as a space for risks and can scaffold learning if necessary	Recognizes the characteristics of maladaptive perfectionism, and empowers the student by providing a safety net while they are learning, exploring, and challenging themselves in the content
Deviance from academic norms	Ability to generalize content, flexible thinking, intellectual creativity, exhibits autonomous thinking	Encourage student to continue to explore content using their prior experiences and diverse perspective; asks them questions about their choice and provides support if necessary

Source: Adapted from Anderson & Coleman-King, 2021.

and girls can support the nuanced needs and challenges of Black girls in STEM programming. In turn, these experiences can assist with exercising resilience and perseverance in overcoming stereotype threat, and support them in taking risks and making mistakes, rather than to procrastinate, avoid challenges, or leave these disciplines. As a recommendation, we encourage GBGs to mobilize their agency to support each other, all the while challenging dominant ideologies and maintaining femininity, Blackness, giftedness, and nurturing STEM identity (Collins et al., 2020).

Nurturing a STEM Identity

Collins et al. (2020) called for spaces to acknowledge and cultivate a STEM identity for GBGs. This early exploration, activation, and recognition of their STEM identities should begin in elementary school. For example, by age six, stereotypes that boys are better than girls at robotics and computer programming lower girls' sense of belonging in computer science and limits their access to activities such as computer games and technological toys. USC partnerships can play a pivotal role in helping to define and support a STEM scholar identity for GBGs. To nurture a STEM identity, instructional leaders and stakeholders must be aware of ways in which we stigmatize and penalize the academic and social renderings of GBGs. There are traits, aptitudes, and behaviors that GBGs may exhibit in formal schooling and out-of-school spaces, that may be counter to the hegemonic views (i.e., white, male, middle-class norms) of academic success in STEM. When educators uphold dominant, stereotypical tropes and ideologies about the behaviors of Black girls, particularly in STEM, they police (e.g., discipline) and potentially limit academic potential. We have provided a few behavioral misconceptions that the literature maintains educators view as problematic behaviors for Black girls (see Table 1). We call for a reframing of these identified "problematic" behaviors and ask stakeholders to shift to a strengths-based lens as they interpret the traits, aptitudes, and behaviors of GBGs. Connecting these identified behaviors to out-of-school programming, the perceptions about the capability, capacity, and demonstrations

of talent of GBGs should be assessed in these types of programming differently than formal K-12 spaces.

Conclusion

As schools and communities assess and challenge the dominant ideologies and pathways of access for GBGs in STEM, stakeholders must use an intersectional lens to understand the needs, experiences, and supports for GBGs interested in STEM. We posit that out-of-school, USC STEM programming has benefitted GBGs and should be utilized in more robust ways. In doing this, we utilize the resources of collective agencies to provide academic and social-emotional support, in addition to reinforcing a sense of belonging for GBGs in STEM. **THP**

Suggested Organization Resources

- ▶ Black Girls Code
www.blackgirlscode.com
- ▶ Black Girls Do STEM
www.bgdstem.com
- ▶ Engineer Girl (National Academy of Engineering)
www.engineergirl.org
- ▶ Girls Pursuing Science
www.girlspursuingscience.com
- ▶ Ignite Worldwide
www.igniteworldwide.org
- ▶ National Girls Collaborative Project
www.ngcproject.org
- ▶ State of Black Girls
www.thestateofblackgirls.org

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Respecting Diverse Student Populations

Editor's Note: This column was written by an alumna of the NAGC Javits-Frasier Scholar program.

In the wake of the Coronavirus pandemic, I pondered what eight years of helping striving readers and one year of experience with gifted learners taught me about the current age of teaching? The following column explores having respect for diversity and my conclusion for what this means for the future of education.

I finally understood the importance of science while in college. The subject was always foreign to me. Then, in my quest to be a teacher, I found the periodic table to be a marvelous creation to explain the naturally occurring elements on earth. The table is updated when an element has been discovered by scientists, who continue to research additional elements based on the numerical data, indicating a missing piece. According to westlab.com, four elements were added in 2020. The new elements have been added to the lower right-hand corner of the table.

It became apparent to me the immense diversity in the world of nature, and I couldn't help but notice the similarities present in the modern classroom. From my "aha" moment with the periodic table I began to use the phrase when there are two, there are many.

How does this relate to diversity and the classroom? Well, if science is advanced enough to know that elements are not fixed, we, as educators should also come to the same conclusion. Our students' understandings, interests, and learning styles are diverse. No two students are alike. This is especially true when working with gifted learners who are striving readers, and in my experience, when there are two, there are many. Striving readers can have an issue with any of the Essential Six areas of reading shown in Table 1.

Table 1. Essential Six Areas of Reading

Phonemic Awareness	Phonics	Vocabulary	Fluency	Comprehension	Oral Language Development
Hearing & manipulation of sounds & letters	Understanding predictable relationships with letters & sounds	Listening – what's heard Speaking – what's said Reading – what's read Writing – what's written	Prosody – good voice of character or narrator Accurately – 95% of the words are known Quickly – to gather at least 75% of the meaning from the author	Highly mental The GOAL of true Reading	Using spoken words to express knowledge, ideas, & feelings

Teacher's often attempt to instruct the striving reader by using a content first approach instead of looking at the diversity of the group before them. Educators must also consider the difficulties gifted striving readers face beyond struggling with the Essential Six areas of reading. Table 2 lists the different ways gifted students can present.

To the novice teacher, gifted learners are often looked at as be-

The Successful Type I	The Divergent Type II	The Underground Type III	The Dropouts Type IV	The Double-Labeled Type V	The Autonomous Learner Type VI
Children who play the game of school well, often underachiever as adults	Children who challenge authority openly, are tactless, & sarcastic	Children who are normally in secondary school grade 6 or higher, who hide their giftedness	Children angry with the system and with themselves for missing their needs. Highly creative can "drop out" emotionally or mentally	Children with learning disabilities and giftedness	Children who make the system work for them respected often with leadership capacity at the school

Table 2. Gifted learners profile types as adapted from Betts and Neihart 1988

ing "just fine" when it comes to learning in the classroom. They are typically given "worksheets" and left to learn on their own, with no appropriate amount of challenge considered. My experience in working with gifted learners has taught me to respect the wide range of talent that I have the pleasure to encounter on a yearly basis. Striving readers who are gifted deserve instructional practices that are engaging and challenging, and striving readers deserve the same as well. I have found it helpful to utilize interest and learning styles inventories, family life surveys, coaching check-ins, and modeling. These techniques can easily be found online and adapted for your classroom use.

Students are the next generation. Appreciating and respecting their diversity is our legacy, for they will be the leaders of tomorrow. Teachers must respect and come to understand the differences that separate the students in our classrooms and teach to those differences. When these students become productive citizens, we will know we have done our jobs well. **THP**

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Turning Over a New Leaf: Creative Wordplay in the ELA Classroom

Tiougholo. How would you pronounce this word? We were equally confused when one of our students presented us with this curious respelling of the word shower. However, once she explained that tiougholo was pronounced as the -ti- in election, the -ough- in bough, and the -olo- in colonel, we realized that this was nothing short of genius. In fact, her play on words was very similar to that of George Bernard Shaw, who, according to urban legend, exposed the world to the absurdities of the English language through a respelling of the word fish. Ghoti—pronounced as the -gh- in the word enough, the -o- in the word women, and the -ti- in the word nation. Hence, fish.



Turning Over a New Leaf

“Progress does not come from technology alone but from the melding of technology and creative thinking through art and design. If the United States wants to remain a global competitor, it will be crucial to foster creative thinking and practice” (Land, 2013, para. 6).

If you ‘google’ the term “wordplay,”

entries will vary—from definitions, such as “the witty exploitation of the meanings and ambiguities of words” (Oxford Lexico, 2020, para. 1) to examples, such as anagrams, chronograms, and lipograms. The possibilities are endless. However, as educators who value a well-rounded approach to education, it is time to view wordplay as much more than a wishy-washy pastime. Wordplay extends far beyond humor and jokes, not only demanding verbal wit but also the manipulation of language and the ability to detect “patterns or twists” (Danesi, 2009, para. 10). Furthermore, because there is no limit as to how letters can be rearranged and semantics can be scrutinized, wordplay nurtures creative thinking and practice. This type of thinking allows individuals to adapt in a world where language evolves as swiftly as science, technology, engineering, and mathematics.

A few years ago, we were approached by an educator in our district who was seeking to enrich the traditional word study program. She knew that the learning experiences of verbally gifted children demanded much more than the ‘regurgitation’ of words. However, her work revealed an overwhelming trend—most word study activities demanded the lowest levels of thinking, requiring skills that called for either remembering or understanding. In fact, activities incorporating higher-level thinking skills were scarce, with searches producing

little to no creative options for students at the elementary level.

Immediately, we ‘jumped on the bandwagon,’ working to develop creative enrichment activities for the educators in our district. We began by considering the characteristics of verbally gifted students. According to research, indicators of verbal talent include a rich vocabulary, a fascination with words and word relationships, an early mastery of the alphabetic code, and an appreciation for linguistic structure (Lee et al. , 2010). Findings also revealed that while verbally gifted students enjoy puzzles and games that allow for linguistic manipulation, they also appreciate and understand verbal humor.

It was with these characteristics in mind that we began our search for an innovative approach to differentiating word study. We referred to the work of VanTassel-Baska (2012), who identified the requirements of gifted language programs as those that allow for a deeper appreciation of syntax, semantics, linguistics, and the history of language. We also reviewed the works of punning artists, Lederer (1998), Bernhard (2010), and Evans (2012). Through these works, we fell ‘head over heels’ for the art of wordplay. Wordplay not only incorporated the higher-level thinking skills noted by VanTassel-Baska but also allowed gifted students to engage humor while exploring the multidimensionality of words. More importantly,

however, was that through wordplay, students would have “open-ended avenues for exploration” (Van Tassel-Baska, 2021, p. 46), allowing for the creation of unique and functional language in their social contexts.

Shake Things Up!

Realizing that wordplay options ranged from phonologically fascinating tongue twisters (such as Peter Piper picked a peck of pickled peppers) to paradoxes and puns, we presented an array of our favorite (tried and true) wordplay activities to teachers in our district. The following list describes several of these activities. Teachers not only identified these activities as ones that ‘got their student’s creative juices flowing’ but also left them ‘grinning like a Cheshire cat.’

Options for Celebrating Absurdity

- As you see from the example above, the creation of “tiougholo” pokes fun at the irregularities in the English language. Introduce your students to the creative respelling of words such as tiougholo; gnowtys (pronounced as the the -gn- in sign, the -ow- in elbow, the -t- in tell, the -y- in symbol, and the -s- in sell); twearchie (pronounced as the -tw- in two, -ear- in early, -ch- in character, and -ie- in field), and ghoti. Then, challenge them to create their own unique respellings. For additional information see Lederer (1998, pp. 147-148).

- Encourage students to Question the Quirkiness. Are all ladybugs female? Are peanuts really nuts? Are hedgehogs really hogs? Are French fries really from France? Encourage students to explore each question, focusing on etymology and the debunking of common misconceptions. For additional ideas, see Lederer (1998, pp. 47-51).

- Explore the evolution of language by breaking down portmanteau words. Portmanteau words are words that are created by blending two words (and their meanings) to create a new word with a new meaning. Common portmanteau words include brunch, smog, motel, and flare. However, more recent ‘trending’ words include hangry, frenemy, glamping, and staycation (a perfect word to describe 2020). Encourage your students to explore the etymology of a cho-

sen portmanteau word or create a new portmanteau word and share via vlog. Additional examples can be found in Evans (2012, pp. 130-133).

Options for Supersizing Synonyms (and Antonyms of course)

- Take synonyms and antonyms to the next level by creating kangaroo and anti-kangaroo words. Kangaroo words are words that are formed by rearranging the letters of synonymous words. Examples include platter and plate; lonely and one; feast and eat; and chicken and hen. After identifying the similarities and differences between these words, encourage students to form words by rearranging the letters of antonymous words (anti-kangaroo words). Examples include pest and pet, communicate and mute, and friend and fiend. For additional examples, see Evans (2012, pp. 117-124).

- Make a ‘simply impossible’ phrase ‘seriously funny’ by introducing your students to oxymorons. Oxymorons are contradictory words that typically appear in conjunction with one another. Encourage students to write stories about ‘jumbo shrimp’ invading ‘mobile homes; ‘honest thieves’ enjoying ‘working vacations; or ‘small crowds’ stuck in ‘rubber cement.’ Remind students to keep all ‘original copies.’ For additional examples, see Evans (2012, pp. 44-50) and Lederer (1998, pp. 16-22).

- Use synonyms to rewrite simple statements. Instead of sharing “A Sailor Went Out to Sea,” or “Star Light, Star Bright” present the titles “A Mariner Shoved Off to the Briny” and “Luminary Luminous, Luminary Phosphorescent.” Encourage students to decode these secretive statements and create synonymous statements of their own using fairy tales or nursery rhymes. For further information and ideas, see Drummond (2019).

Options for Stepping Beyond the Sort

- When planning for phonics, think beyond the traditional word sort (grouping words solely by sound). Challenge students to sort words by “sound and sense” (Lederer, 1998, p. 151). Introduce words such as clump, lump, plump, hump, bump, and mump. Focus on both sound and sense—asking students

what these words have in common (a rounded mass and the “ump” sound). Challenge students to create counterexamples (e.g. dump and grump) and question whether forced association could be used to include such counterexamples in the sound and sense sorts. Also, consider using words that include nasal sounds (such as sn- and -ng) with a common meaning. While words such as snort, snot, sneeze, snout, and sniff refer to the nose, words such as bang, clang, rang, sang, bing, and cling describe the sound of hitting metal. For additional examples, see Lederer (1998, pp. 151-157).

- Substitute compound word/not compound word sorts for word puzzles that examine the connections between compound words. For example: when teaching compound words that include by-, present students with “___ line, ___ pass, ___ law, and ___ stander.” Ask them to identify one word that could be added to each to form compound words (byline, bypass, bylaw, and bystander). Discuss how each word’s meaning has been altered. Also, consider words that can be added after each to form compound words (such as shortcake, hotcake, teacake, and pancake).

Wrapping it Up!

As teachers of the 21st Century, we must consider the role that language plays in determining our futures. Although we cannot predict how it will change, we know beyond a shadow of a doubt that language will continue to evolve over time. We also know that while wordplay allows for unlimited exploration, it also promotes creativity through divergent thinking. It is for this reason that we hope you will consider presenting your students with the ‘best of both worlds.’ So, go ahead...

Bite the bullet.

Take a shot in the dark.

Give wordplay a go in your ELA classroom. **THP**

Don't Take It for Granted

Advocacy never ends. Believe me, I know how exhausting it can be to be constantly speaking up, taking on obstacle after obstacle, and always educating the new guy or gal about gifted students and their needs. The thing is, though, it starts to pay off. You notice a teacher differentiating in her classroom. You're blown away by the principal's brilliant new idea for tweaking the schedule and student groupings so as to target interventions to narrower and more appropriate bands of learners. The new student who is so far ahead in math is subject accelerated by the math department without you needing to be the one steering the process. It's beautiful, really. Your hard work has paid off. People "get it" *and* they do something about it.

But don't take it for granted.

That new teacher? That new administrator? That new school board member? The teacher who has switched jobs to a new position in a new school? It may very well be that they all need the same message you have already delivered a hundred times. And they're all in a position to undo what was previously accomplished on behalf of your gifted students. (Ask me how I know...) Don't take it for granted that they're on the same page as those you've already worked with, no matter how kind or open they seem to be. Better they hear a known message through a new filter than never be exposed to it at all and then make detrimental decisions. Well meaning and best practice are not the same thing.

Advocacy never ends. Believe me, I know it seems those gifted students are going places. They have big dreams and big talents to put behind those dreams. They amaze you with their insightful questions and the three novels they've written and the college courses they're taking in high school. It's beautiful, really. Your hard work has paid off and they are well on their way to a great future.

But don't take it for granted.

That big-hearted girl who was going to be a veterinarian? That boy who overcame so much and was about to launch his career? That smartest-student-you've-ever-worked-with who knew things you didn't even know were a thing? They could commit suicide or be in jail for murder or end up aimless and jobless. (Ask me how I know...) Don't take it for granted that their path is sure. Most will have a happy, successful life. But all still need challenging opportunities, someone who is on their team and self-advocacy skills—even help from time to time. Life may still get in the way. But leave everything on the field so at least you know you did

your part. The rest is up to them.

Advocacy never ends. Believe me, I know how widespread the need is. It's not just your students, your classroom, your school, your district. It's the schools down the road and the neighboring county, it's the state Legislature and Congress.

It's the parents of your students, the local community organizations, and random strangers with whom you cross paths. But most people "get it" when you explain it. It's a beautiful thing, really. Your hard work has paid off in a well-crafted message that is sought and utilized and heard.

But don't take it for granted.

That new mayor you just met at a rally? That person sitting next to you on the airplane? The family you are seated with at the wedding reception? You never know when an opportunity may arise to offer insights and information about gifted learners and their needs. (Ask me how I know...) Don't take it for granted that they're probably not interested or wouldn't understand. A mention of what you do may just light them up with curiosity. Not always, and in those cases just let it lie. But when you discover that budding kindred spirit, strike while the iron is hot. There's always more web to weave. **THP**

**"Advocacy
 never ends."**

buried under books

continued from page 11

<https://lincs.ed.gov/publications/pdf/PRFbooklet.pdf>

For a list of resources about the Science of Reading visit <https://www.apmreports.org/story/2022/10/20/science-of-reading-list>

For activities that you might use to reinforce and support elementary students' ability to read effectively check out the student center activities at <https://fcrr.org/>

For information on Dyslexia visit <https://www.understood.org/en/articles/what-is-dyslexia> and <https://dyslexiaida.org/frequently-asked-questions-2/> **THP**



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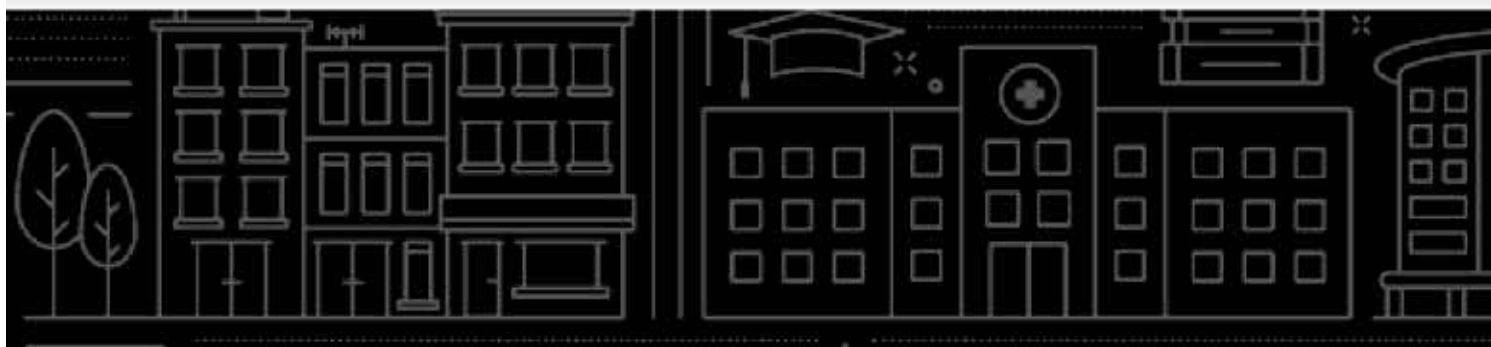


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