When Curiosity Leads the Way: Teaching for Neurodivergent Strengths

Nancy Peterson-Caton, EdD Candidate

New England College

For comments or questions for the author, contact Nancy Peterson-Caton at

NPeterson-Caton_GPS@nec.edu

Abstract

This article explores how reframing attention-deficit/hyperactivity disorder (ADHD) through a neurodiversity-affirming lens reveals not only challenges but also distinct strengths that can be cultivated in classrooms. Research has highlighted those students with ADHD often excel in divergent thinking, hyperfocus, adaptability, and leadership potential, especially when learning tasks are meaningful and engaging. Neuroscientific evidence has further demonstrated that ADHD brains activate networks associated with imagination and rapid idea generation, underscoring their capacity for originality and innovation. The universal design for learning (UDL) framework provides a practical pathway for educators to harness these strengths by offering multiple means of engagement, representation, and expression. Strategies such as emphasizing choice, balancing novelty with structure, and recognizing creativity as an asset shift the focus from remediation to empowerment. Ultimately, teaching to neurodivergent strengths enriches learning environments for all students, positioning ADHD-related traits as vital contributions to classrooms, workplaces, and communities.

Keywords: attention-deficit/hyperactivity disorder (ADHD), neurodivergent, neurodiverse affirming, neurodiversity, universal design for learning (UDL)

Imagine walking into a classroom and noticing students whose ideas seem to spill out faster than they can capture them on paper. These same students often spot connections others

miss, grasp the big picture instantly, and light up and engage when the learning feels meaningful. For many learners, especially those with attention-deficit/hyperactivity disorder (ADHD), this is not just a feature of their personalities, it is how their brains are wired. Research on creativity and neurodivergence (Armstrong, 2015; Hoogman et al., 2020; Nordby et al., 2023) has shown that traits that are often labeled as distractible or impulsive can drive innovation, curiosity, and extraordinary focus when the right conditions are present. Yet these strengths are not always accessed in today's schools that are designed around uniformity and compliance. By reframing how we view differences and how we structure opportunities for exploration, educators can tap into these strengths and help create opportunities for learning that benefit every learner (Armstrong, 2012, 2015; Hoogman et al., 2020; Nordby et al., 2023).

Literature Review

Creativity and Divergent Thinking in ADHD

A growing body of research has suggested that ADHD is not only associated with challenges in executive functioning but also with creative strengths. Hoogman et al. (2020) reviewed behavioral studies and found consistent evidence that individuals with ADHD tend to outperform peers on divergent thinking tasks (e.g., generating multiple novel ideas to open-ended prompts). This suggests that ADHD brains can be especially strong in flexibility, range of perspectives, and idea generation. Armstrong (2015) argued that such findings challenge deficit-oriented assumptions and call for embracing neurodiversity, or valuing difference as variation, not deficiency.

Neuroscience research has provided additional support for this way of thinking. Kuang et al. (2022) conducted a meta-analysis of 57 functional magnetic resonance imaging (fMRI) studies, showing that divergent thinking and insight rely on distinct neural networks. Kuang et al.

(2022) found divergent thinking activates brain regions associated with imagination, associative memory retrieval, and flexible combination of ideas—consistent with fast, intuitive "system 1" processing (automatic, effortless thinking). By contrast, insight depends more on control, monitoring, and emotional/memory circuits—typical of slower, deliberative "system 2" thinking (conscious, effortful reasoning). Sousa (2022) similarly emphasized that effective teaching must account for how the brain encodes and retrieves information across these networks, providing a foundation for instructional frameworks like universal design for learning (UDL).

These findings align with UDL, whose guidelines are anchored in neuroscience and the learning sciences (CAST, 2024; 2025). UDL describes three brain networks: affective, recognition, and strategic. They correspond to the UDL design principles of engagement, representation, and action and expression (Novak & Rose, 2016). By offering multiple means of engagement, educators can provide choice, novelty, and opportunities to explore while leveraging ADHD learners' divergent thinking advantage, mitigating the constraints of narrow, rigid tasks. Sousa (2022) reinforced this connection, noting that learning is strengthened when instruction deliberately activates multiple neural pathways, making information more accessible and memorable.

Hyperfocus, Adaptability, and Leadership Potential

Although ADHD is often stereotyped as distractibility, qualitative research has revealed a different side. In a thematic analysis of adults with ADHD, Nordby et al. (2023) reported that hyperfocus—sustained, deep concentration on meaningful tasks—can drive productivity and achievement. Participants also described strengths in adaptability, energy, and the capacity to act decisively in fast-changing contexts. Fung et al. (2022) similarly framed neurodiversity as an

"invisible strength," noting leadership traits such as vision, enthusiasm, and motivational influence, even when organizational or executive capacities are weaker.

UDL's principle of multiple means of action and expression provides a structure for turning these strengths into classroom assets. By allowing students to choose how they demonstrate mastery—projects, presentations, visual maps, podcasts, or leadership roles—teachers can let hyper-focused energy, creativity, and adaptability surface meaningfully.

Conditions That Unlock Strengths

These strengths do not flourish automatically; they require environments designed to reduce barriers. Cherewick and Matergia (2023) showed how supportive contexts unlock autistic strengths, a logic that applies to ADHD as well. Foundations Cognitive Schools (2025) emphasized that different neural networks confer different advantages, and thus learning environments should be designed to cultivate those advantages rather than suppress them.

This is precisely the goal of UDL. The CAST (2025) UDL Guidelines present concrete design options across three core principles: engagement, representation, and action and expression, to proactively address common barriers. For example:

- In engagement, the UDL Guidelines suggest optimizing choice, relevance, emotional support, and persistence scaffolds to sustain motivation (CAST, 2024).
- In representation, the UDL Guidelines encourage teachers to use multiple modes (text, audio, visuals) to support perception and comprehension (CAST, 2024).
- In action and expression, the UDL Guidelines recommend offering alternatives (writing, speech, drawing) and planning scaffolds to reduce executive load (CAST, 2024).

Bridging Research and Practice: Applying UDL to ADHD Strengths

Taken together, the ADHD strength literature (Armstrong, 2012, 2015) and UDL research (CAST, 2024, 2025) converge: ADHD learners often bring divergent thinking, deep focus, energy, adaptability, and untapped potential. UDL offers a research-grounded design framework to make those abilities visible and scaffolded. Rather than retrofitting accommodations, UDL asks educators to design learning spaces from the start to reduce barriers and elevate strengths, recognizing learner variability as the norm (CAST, 2024, 2025).

When teachers integrate UDL principles, offering choice, multimodal representation, scaffolded planning, and multiple ways to show mastery, they create environments where students with ADHD not only cope but thrive (CAST, 2024, 2025). This shifts the paradigm from remediation to asset cultivation, rooted in both cognitive science (Armstrong, 2015; Foundations Cognitive Schools, 2025; Sousa, 2022, 2024) and classroom evidence (Fung et al., 2022; Nordby et al., 2023).

Discussion

From Theory to Classroom Practice

Research on attention-deficit/hyperactivity disorder (ADHD) and creativity has highlighted the importance of learning environments that both unlock curiosity and reduce barriers. The universal design for learning (UDL) framework provides a practical way to translate these insights into classroom practice. UDL emphasizes providing multiple means of engagement, representation, and action/expression so that all learners can access content, stay motivated, and demonstrate their knowledge in diverse ways (CAST, 2024, 2025). For students with ADHD, this means creating a balance between novelty and predictability, an approach supported by Cherewick and Matergia (2023), who argued that neurodivergent strengths flourish

when environments provide both freedom and support. Sousa (2024) made a similar point from a brain-based perspective, showing that novelty sparks curiosity and attention while predictable routines allow for consolidation and retention.

One effective strategy is to integrate novelty with purpose through project-based learning, STEM/STEAM challenges, or creative outlets such as drama and writing. These allow students with ADHD to channel divergent thinking into authentic problem-solving and innovation (Armstrong, 2015; Hoogman et al., 2020; Nordby et al., 2023). At the same time, consistent structures, like clear routines, visual schedules, and task checklists, help reduce the executive functioning barriers that can otherwise prevent students from sharing their creative insights (Foundations Cognitive Schools, 2025). This dual emphasis mirrors the findings of Kuang et al. (2022), who showed that divergent thinking relies on fast, intuitive brain networks while insight depends on slower, controlled processing. Classrooms designed with both systems in mind provide opportunities for rapid idea generation while scaffolding the reflective processes needed to refine and communicate those ideas.

Finally, UDL encourages teachers to offer choice and flexibility, enabling students to pursue areas of personal interest while still meeting learning goals. For learners with ADHD, this not only increases motivation but also creates opportunities to demonstrate originality and hyperfocus, with periods of intense, sustained attention on a task of high personal interest (Nordby et al., 2023). For example, a student who struggles with traditional writing tasks may thrive when allowed to design a video, podcast, or model as an alternative means of expression. In this way, UDL helps educators move beyond deficit-based approaches to ADHD, designing classrooms where neurodivergent strengths are not incidental but intentionally cultivated.

Beyond the Classroom Walls

It is important that educators, especially those in high schools, think about what skills teachers are helping our students build that will allow them to be more successful in their postsecondary endeavors. The creative strengths associated with ADHD do not end in the classroom; they extend into postsecondary life and can be powerful assets in professional and community settings. Nordby et al. (2023) found adults with ADHD described hyperfocus as a driver of achievement, enabling them to maintain deep attention and be highly productive when tasks are personally meaningful. This ability, paired with adaptability and high energy, makes individuals with ADHD well-suited for fast-changing environments such as entrepreneurship, the arts, or crisis management.

Fung et al. (2022) described these qualities as an "invisible strength," noting that enthusiasm, vision, and the ability to inspire others can signal leadership potential even when organizational skills fall short of conventional expectations. The same divergent thinking that sparks unconventional ideas in school can later drive innovation and problem-solving in workplaces and communities. Increasingly, businesses value employees who can recognize patterns others overlook or generate creative solutions under pressure—capacities that individuals with ADHD often display naturally (Armstrong, 2015; Norby, 2023).

Educational systems that embrace frameworks like UDL prepare students not only for academic success but also to apply their neurodivergent strengths in broader society (CAST, 2024, 2025; Stapleton-Corcoran, 2022,). Through classroom practices that emphasize choice, flexibility, and scaffolding, teachers foster skills that equip students to navigate professional environments where originality and resilience are prized. In doing so, the connection between

school and life beyond it is reinforced, positioning ADHD-related strengths not as exceptions to be accommodated but as valuable contributions that enrich workplaces and communities.

Practical Tips for Educators

Recognizing ADHD as a source of creativity and innovation may be a shift in the mindset for some, but by doing so and implementing intentional classroom practice, one can help students access and refine those strengths. The following strategies align with research on neurodivergence and UDL, as well as taking a neurodivergent affirming approach, in hopes to offer educators practical ways to create inclusive and empowering learning environments.

- **Notice and Highlight Creative Strengths**: Many students with ADHD have learned to view themselves through a deficit lens. By age 10–12, children with ADHD may receive roughly 20,000 more negative comments than their peers. This steady stream of criticism can damage self-esteem, create a sense of flaw, and reduce emotional resilience (Frye, 2020). Teachers can help counter this by explicitly positively recognizing moments of originality, curiosity, or persistence in student work. As Armstrong (2015) noted, reframing difference as variation rather than deficit helps students internalize positive identities as learners.
- **Design Tasks That Invite Original Solutions**: Research has shown that divergent thinking is a relative strength for ADHD learners (Hoogman et al., 2020). Open-ended projects such as designing experiments, writing plays, or developing community proposals, allow students to highlight creativity while also meeting core standards.
- **Balance Novelty with Predictability**: Cherewick and Matergia (2023) emphasized that neurodivergent strengths emerge when environments balance curiosity and

exploration with supportive routines. Teachers can structure lessons with consistent expectations (visual schedules, checklists, or step-by-step rubrics) while building in choice and flexibility so students can pursue personal meaningful pathways. As Sousa (2024) explained, novelty activates reward networks in the brain, but these must be paired with repetition and structure to strengthen neural connections and ensure lasting learning.

- **Leverage Hyperfocus for Deep Learning**: Nordby et al. (2023) found that adults with ADHD described hyperfocus as a powerful strength when tasks are intrinsically motivating. Educators can harness this by creating opportunities for passion projects, extended inquiry, or leadership roles in areas where students' engagement runs especially deep.
- **Value Energy and Leadership Potential:** Learners with ADHD often contribute high energy and enthusiasm to group settings, motivating and inspiring their peers. Fung et al. (2022) framed this as an invisible strength in leadership contexts. Teachers can channel these qualities through rotating leadership roles, peer mentoring, or presenting ideas to authentic audiences.
- **Apply UDL as a Guiding Framework**: The UDL guidelines (CAST, 2024, 2025) emphasize multiple means of engagement, representation, and expression. By offering varied options—such as visual projects, oral presentations, or multimedia storytelling, teachers can ensure that creativity and originality are recognized as essential parts of learning, not incidental to student success.

Taken together, these strategies move the focus from remediation to recognition and affirmation of neurodivergent strengths (Armstrong, 2015). By intentionally designing learning opportunities

that celebrate originality, curiosity, and leadership, educators not only help students with ADHD thrive but also model inclusive, strengths-based practices that enrich learning for all.

Next Steps and Resources

For educators who are ready to take the next step in designing neurodiversity-affirming classrooms, the following resources offer practical guidance:

- **CAST UDL Guidelines (2025):** An interactive framework with checkpoints and examples for applying multiple means of engagement, representation, and action/expression. (http://udlguidelines.cast.org)
- **Sousa (2022, 2024):** Accessible texts on how the brain learns and adapts, highlighting the role of novelty, memory, and attention in classroom practice. (*How the brain learns; Engaging the rewired brain)*
- **Novak and Rose (2016), *UDL Now!*:** A step-by-step guide for K–12 educators looking to bring UDL into daily instruction with concrete strategies.
- **Armstrong (2015):** A neurodiversity-affirming perspective that reframes ADHD and other differences as valuable variations rather than deficits. (The myth of the normal brain: Embracing neurodiversity. *AMA Journal of Ethics*)
- **Understood.org and CHADD.org**: Free educator and parent resources that provide classroom strategies, checklists, and strength-based approaches to supporting students with ADHD. (https://www.understood.org/ and https://chadd.org/)

These resources extend the conversation beyond theory, offering concrete tools to implement practices that recognize and elevate the strengths of neurodivergent learners.

Conclusion

Across the research, a clear theme has emerged: ADHD is not defined solely by distraction or deficit but by a range of strengths that fuel creativity, adaptability, and leadership. Studies on divergent thinking (Hoogman et al., 2020) and hyperfocus (Nordby et al., 2023) have highlighted how ADHD brains thrive when offered opportunities for originality and meaningful engagement. Armstrong's (2012, 2015) challenge to the "myth of the normal brain" underscored the need to reframe difference as diversity, while Fung et al. (2022) and Cherewick and Matergia (2023) demonstrated how strengths flourish in environments that balance novelty with structure.

For schools, the implication is clear: strength-based practices and frameworks like UDL (CAST, 2024) are essential. By designing lessons that provide multiple entry points, encourage curiosity, and validate diverse ways of demonstrating knowledge, teachers can help students with ADHD thrive. Foundations Cognitive Schools (2025) further emphasized that different neural networks bring distinct advantages, and it is the responsibility of educators to notice and nurture these.

Ultimately, I believe viewing ADHD through a neurodiversity affirming lens shifts the goal from fixing students to empowering them as contributors. When classrooms embrace creativity, flexibility, and risk-taking, they become spaces where all learners benefit. As Sousa (2022, 2024) underscored, teaching grounded in brain science equips educators to design learning that not only reduces barriers but also amplifies the originality and adaptability students bring. By recognizing potential rather than focusing solely on problems, educators can ensure that neurodivergent students' sparks of creativity are protected, cultivated, and celebrated as essential to the learning community and to society at large.

As a special education administrator, educator, neurodivergent person, and parent of neurodivergent learners, I have witnessed the transformative impact of strength-based practices. My multifaceted perspective reinforces this research because I have seen the positive effects of an asset-based approach: when schools design for creativity and adaptability, they empower students not only to succeed academically but also to flourish as contributors in their communities.

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