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2025 CAE Community Symposium Superpowers in Action: How Neurodivergent Minds Excel in Cybersecurity

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Superpowers in Action: How Neurodivergent Minds Excel in Cybersecurity

- Research indicates that neurodiverse individuals often excel in areas such as analytical thinking, attention to detail, and problem-solving, which are critical in cybersecurity Krzeminska et al
- Research by Hopfield found that tasks the brain performs are inherently temporal, ranging from recognizing and generating complex spatiotemporal patterns to creating temporal expectations of when an event will occur
- Autistic participants also demonstrated superior performance on tasks like the Embedded Figures Test, which involves searching cluttered fields to find hidden shapes

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- Tailored accommodations are essential for enabling learners with disabilities to demonstrate their knowledge and abilities equitably, upholding their right to inclusive and quality education
- Accommodations aim to provide students with disabilities the opportunity to showcase their knowledge without the interference of their disabilities, ensuring a fair evaluation compared to their peers
- Specifically designed accommodations for academic disabilities have been found to enhance performance on high-stakes assessments, highlighting the importance of leveling the playing field for students with disabilities

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Common Accommodations for Neurodiverse Learners

- Simplify and Structure Learning Materials
- Chunking Information: Breaking down content into smaller, manageable segments reduces cognitive overload (Sweller, 2011).
- Reducing Redundant or Distracting Elements: Extraneous visuals, animations, and excessive text can be overwhelming. Minimalist design and clear navigation are recommended (Mayer & Moreno, 2003).
- Providing Advance Organizers: Summaries, outlines, or mind maps help students mentally organize material before engaging with detailed content (Ausubel, 1960).

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Common Accommodations for Neurodiverse Learners

- Enhance Instructional Clarity
- Explicit Instructions: Clear, step-by-step guidance reduces unnecessary cognitive processing (Kirschner, Sweller, & Clark, 2006).
- Consistent Layout and Navigation: Predictable course structures prevent students from spending cognitive resources on figuring out where to find materials (CAST, 2018).
- Multimodal Content: Offering materials in multiple formats (text, video, audio) accommodates different cognitive processing preferences (Mayer, 2009).

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Common Accommodations for Neurodiverse Learners

- Increase Personalization and Flexibility
- Self-Paced Learning: Allowing students to control the pacing of lessons helps them manage cognitive load effectively (Mayer & Pilegard, 2014).
- Adjustable Cognitive Demands: Offering different difficulty levels or scaffolding through optional hints and guidance can support learners at their own pace (Vygotsky, 1978).
- Adaptive Learning Technologies: AI-driven tools that adjust difficulty based on student responses can help reduce extraneous cognitive load (Aleven et al., 2016).

2025 CAE Common Accommodations for Neurodiverse Learners

- Improve Support Mechanisms
- Instructor and Peer Support: Synchronous Q&A sessions and peer discussion forums provide additional explanations and reduce cognitive strain (Richardson, Maeda, & Swan, 2017).
- Cognitive Offloading Tools: Note-taking aids, text-to-speech, and AI-based summarization tools can help neurodivergent students manage their cognitive resources (Moreno & Mayer, 2007).
- Executive Function Support: Tools like reminders, checklists, and structured calendars help students manage tasks without additional cognitive burden (Dawson & Guare, 2018).

2025 CAE Common Accommodations for Neurodiverse Learners

- Incorporate Universal Design for Learning (UDL) Principles
- Multiple Means of Engagement: Providing various ways for students to interact with the content ensures accessibility for different cognitive styles (CAST, 2018).
- Flexible Assessments: Offering multiple ways to demonstrate knowledge (e.g., written reports, presentations, video responses) reduces unnecessary cognitive strain.
- Minimizing Time Pressure: Timed exams or rigid deadlines can exacerbate cognitive overload; allowing flexibility helps alleviate stress (Rose & Meyer, 2002).

2025 CAE Common Accommodations for Neurodiverse Learners

- The Universal Design for Learning framework has been proposed as a valuable tool for supporting neurodiverse student populations by providing flexible learning options that cater to diverse learning styles and needs
- Universal Design for Learning is an instructional design framework that aims to create inclusive and accessible learning environments for all students, considering the diverse range of skills and abilities that learners possess
- The core principles of UDL focus on providing multiple means of representation, engagement, and expression to cater to the varied learning styles and needs of students



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