

From accommodation to affirmation: ALIGNing technology, assessment, and neurodivergent learner's needs

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Students with Attention Deficit Hyperactivity Disorder (ADHD) – or other neurodivergent or mental health conditions – face persistent executive functioning challenges that conventional higher education assessment models and technologies often fail to accommodate. In this paper, affordance theory is applied to demonstrate how educational technologies, when thoughtfully integrated with assessment design, can either support or hinder these learners. The Affordance-Led Inclusive Guidance for Neurodivergence (ALIGN) is introduced as a theory-informed, action-oriented framework that enables educators and designers to drive intentional alignment of executive functioning needs with technological and pedagogical affordances. This initial iteration aims to guide educators in creating inclusive, affirming learning environments, with co-design and validation with neurodivergent learners planned for future phases. ALIGN shifts the focus from individual accommodation toward leveraging neurodivergent strengths – such as creativity and divergent problem-solving in ADHD – within flexible, feedback-rich assessments. By aligning cognitive diversity, technology use, and assessment practice, ALIGN offers a conceptual and practical pathway for systemic transformation in higher education, supporting equity and neuroaffirmation at scale.

Keywords: ADHD, affordance theory, educational technology, executive functioning, inclusive assessment, neurodiversity

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Introduction

Assessment is central to learning in higher education, yet conventional formats conflict with the cognitive and behavioural profiles of neurodiverse students. This study focuses on learners with attention-deficit/hyperactivity disorder (ADHD), one of the most prevalent neurodevelopmental conditions, where executive functioning difficulties are defining characteristics (Barkley, 2012). While executive functioning difficulties are common across many neurodivergent and mental health conditions – including autism, dyslexia, and anxiety-related disorders – they are a core feature of ADHD and a consistent predictor of academic challenges in this group (Barkley, 2012). Supporting executive functioning is critical when designing assessment environments that affirm ADHD learners. An increasing number of university students self-identify with ADHD (Álvarez-Godos et al., 2023). Executive functioning difficulties impact academic performance yet coexist with strengths like creativity and divergent thinking (Pagespetit et al., 2025) – often overlooked in traditional assessment models (White & Shah, 2006). Timed examinations, high-stakes tasks, and rigid rubrics rely on linear progression, consistent effort, and organised output. For ADHD students, these assumptions can be exclusionary, failing to account for diverse cognitive and engagement

styles.

Affordance theory and executive functioning in educational technologies

Affordance theory provides a valuable lens for understanding how educational technologies can support learners with ADHD, by focusing on actionable possibilities that systems offer – shaped by both design features and learner perceptions (Creely & Henriksen, 2025; Norman, 1999). These affordances are neither fixed nor neutral; they vary with assessment design, learner goals, cognitive profiles, and sociocultural contexts (Alhosani, 2023; Bower, 2008).

As a core element of ADHD and a key predictor of academic challenges (Barkley, 2012), executive functioning influences both task performance and how learners engage with digital affordances. This extends beyond task completion difficulties to how students recognise, interpret, and act on technological and assessment features designed to support them (Greene & Azevedo, 2007).

For instance, the same learning management system (LMS) can either constrain learners by delivering content in rigid, summative formats or empower them through formative, portfolio-based assessments including scaffolds such as prompts, deadlines, and interactive dialogue tools. However, features intended to support autonomy may cause cognitive overload for ADHD learners, particularly in unstructured or inflexible environments (Serrano et al., 2023). For example, open-ended discussion forums may be rich in potential interaction but overwhelming unless clearly structured with prompts, time cues, or feedback mechanisms (Barkley, 2012).

By interpreting educational affordances through the lens of executive functioning, educators and designers can better anticipate how students with ADHD navigate complexity, respond to structure, and engage in reflection. This perspective lays the foundation for the development of the ALIGN, an actionable framework that guides educators and learning designers in implementing neurodiversity-affirming educational practices.

The categories of executive functioning operationalised in ALIGN draw heavily on Brown's (2006) six-cluster model, which was informed by extensive clinical research involving children, adolescents, and adults diagnosed with ADHD. This model includes activation, focus, effort, emotion regulation, memory, and action. This holistic conceptualisation reflects the complex, interrelated executive challenges faced by neurodivergent learners. By mapping affordances to these clusters, ALIGN provides a structured approach to understanding and supporting learners' cognitive needs in digital and assessment contexts, while maintaining flexibility to accommodate diverse profiles.

The Affordance-Led Inclusive Guidance for Neurodivergence (ALIGN) practical framework

The ALIGN framework (Table 1) is a theory-informed, action-oriented framework designed to support educators, learning designers, and researchers in creating, evaluating, and adapting educational technologies and assessment designs to meet the executive functioning needs of neurodivergent learners, particularly those with ADHD.

Built on a relational view of affordance and drawing from Norman's (1999) distinction between actual and perceived affordances, ALIGN stresses that inclusive design requires more than just the presence of features like flexible deadlines or multimodal submissions. These affordances must be *perceived* and *usable*, especially by learners whose executive functioning profiles influence how they interact with digital and assessment environments.

ALIGN translates affordance theory into actionable strategies, mapping executive

functioning challenges to technological features and assessment conditions to maximise their accessibility and effectiveness. This creates a structured framework for identifying when and how affordances support neurodivergent learners.

ALIGN was developed through a synthesis of research on executive functioning challenges and practical guidance from the literature on inclusive educational design. It draws on research examining how executive dysfunction impacts academic engagement, assessment performance, and learner autonomy (Henning et al., 2022), as well as existing best-practice recommendations and accommodations aimed at supporting students with impaired executive functioning, such as the *Advance HE Toolkit: Education for Mental Health – Inclusivity ADHD* (2025), the *NESTL toolkit* (2025) and the *Universal Design for Learning (UDL) Guidelines* developed by CAST (2024). Although ALIGN has not yet undergone formal empirical testing, it draws on a robust synthesis of theoretical and practical insights. Table 1 operationalises this foundation into a structured framework that empowers educators to design and evaluate inclusive supports.

Table 1: Affordance-Led Inclusive Guidance for Neurodivergence (ALIGN)

Executive Function Cluster (Brown, 2006)	Affordance	Guiding Questions
Activation	<i>Guided task initiation</i>	Are tasks broken into smaller, manageable steps? Are there prompts, visual guides, or scaffolds to help learners get started? Are templates available to reduce ambiguity and lower initiation barriers?
Activation	<i>Temporal flexibility and time awareness</i>	Can students control the pacing of their work? Are there visual timelines or reminders? Can learners access built-in extensions or flexible deadlines?
Activation	<i>Structured organisation and workflow clarity</i>	Are learning tasks clearly grouped or sequenced? Are learners supported in organising their materials and tracking their progress? Are templates or visual structures provided to scaffold logical workflow?
Focus	<i>Attention regulation and sustained engagement</i>	Are there different modes of interaction to suit attention needs (e.g., text, audio, video)? Can learners minimise distractions (e.g., hide features, simplify views)? Are there visual indicators of progress to support focus and momentum?
Focus	<i>Cognitive flexibility</i>	Are learners actively supported in shifting between diverse tasks, concepts, or strategies as needed? Are learners encouraged and provided with opportunities to explore multiple perspectives or alternative approaches?
Emotion	<i>Emotional regulation</i>	Is feedback framed constructively and delivered timely? Are there built-in supports – such as encouraging messages, flexible deadlines, or low-stakes checkpoints – that reduce anxiety and support emotional well-being?
Memory (working memory)	<i>Cognitive offloading and memory support</i>	Are learners supported in recalling and managing task requirements over time? Are stepwise instructions, worked examples, check lists or multimodal representations provided to reduce working memory load? Are students guided to summarise their own understandings?
Action	<i>Impulse control, regulated decision-making and pacing</i>	Are there built-in pauses, confirmations, or structured steps that help learners reflect before submission or progressing to the next stage? Are there sequencing tools, checklists, or gated progressions to scaffold thoughtful engagement?
Action	<i>Self-monitoring: awareness of progress and strategy adjustment</i>	Is there real-time feedback or progress indicators? Are there opportunities for structured reflection or review of previous work to inform future choices?
Communication and Interaction Supports*	<i>Structured, accessible communication and scaffolded social engagement</i>	Are communication tools accessible and clearly structured? Do learners have options for asynchronous and synchronous engagement? Are there prompts or scaffolds that support meaningful, low-stress interaction?

*Communication and Interaction Supports is included as a complementary category to address the social-executive demands of learning environments and is not a core executive function cluster in Brown's (2006) model.

Applying ALIGN to inclusive assessment design

ALIGN's core value lies in guiding approaches that actively support executive functioning. ALIGN drives the integration of technology use, assessment design, and cognitive needs of students with ADHD, offering a clear path toward inclusive learning and assessment environments. Rather than assessing technologies solely for usability or feature lists, ALIGN focuses on the specific *affordances* that can scaffold ADHD learners' planning (Activation), attention regulation (Focus), and self-monitoring (Action) – *particularly when paired with thoughtful assessment models*. It guides educators to identify and implement design features supporting executive functioning via mapped affordances and guiding questions.

As can be observed in the illustrative example presented below, by reframing evaluation around affordances, ALIGN promotes a proactive shift, empowering educators to move beyond accommodation to affirm and leverage neurodivergent cognitive strengths through inclusive design. It helps educators make deliberate decisions not only about platform adoption, but also about how platforms are paired with assessment models and learning activities. Importantly, ALIGN is not intended to be prescriptive or exhaustive. Rather, it offers a flexible action-oriented framework that can be adapted to diverse learning contexts and used alongside other accessibility and inclusion guidelines. As such, it serves as a practical bridge between theory and practice – grounded in current research, informed by neurodiversity perspectives, and oriented toward systemic transformation in how we design for cognitive difference.

Illustrative application of the ALIGN framework

In a hypothetical undergraduate engineering unit, students are assessed through two high-stakes tasks: a technical report and a live presentation. In previous iterations, high stress and low submission rates were common, especially among students with ADHD. Using the ALIGN framework, the assessment design is critically evaluated and redesigned through the lens of executive functioning challenges, resulting in the following targeted changes:

Activation – Time Management: Major deadlines are distributed over a broader window. LMS is configured to send automated reminders.

Activation – Task Initiation: The final report is broken into sequenced checkpoints – proposal, outline, draft – each with low-stakes, formative feedback.

Activation – Organisational Support: A planning template is integrated to explicitly scaffold task management.

Emotion – Emotional Regulation: Submission windows are made flexible to reduce anxiety. Emotional well-being is supported through encouraging feedback and optional check-ins with staff.

Communication and Interaction Supports: Accessible communication channels and structured opportunities for asynchronous and synchronous tutor or peer interactions are provided, helping reduce isolation and support low-stress engagement.

These shifts transform the assessment from a high-pressure, binary outcome into a scaffolded, student-centred portfolio process. Students with ADHD report increased confidence and task engagement, with improved rates of completion and participation across the cohort.

While hypothetical, the scenario reflects common challenges in higher education and illustrates how ALIGN can be adapted to diverse disciplinary contexts where executive functioning demands are high.

ALIGN's contribution to inclusive education frameworks

As educators increasingly draw on major inclusion resources such as UDL (CAST, 2024), the *Advance HE Toolkit* (2025), and the *NESTL toolkit* (2025), there remains a need for practical frameworks that translate broad principles into concrete strategies for supporting specific neurodivergent profiles – such as ADHD. These existing frameworks provide valuable high-level guidance for curriculum planning, policy alignment, and general accessibility. However, they tend to focus on barrier reduction at the institutional or course level and rarely engage with the granular challenges of assessment design, and the impact on executive functioning.

ALIGN addresses this critical gap by focusing specifically on ADHD and the cognitive dimensions that shape students' interactions with both assessment and technology. Unlike frameworks that emphasise checklist-style accommodations or broad inclusion principles, ALIGN offers a flexible, actionable framework that guides educators in designing assessments that affirm rather than accommodate neurodivergent learners. Its affordance-based mapping – linking executive functioning challenges with intentional supports – makes it uniquely actionable in day-to-day practice.

Where UDL offers essential principles for universal access, and the *Advance HE* and *NESTL* resources guide inclusive culture and policy development, ALIGN zooms in on the design level, prompting educators to consider how specific affordances can scaffold executive functions across each stage of assessment. In doing so, it complements existing frameworks while advancing a shift from compliance-driven accessibility to the affirmation of neurodivergent cognitive strengths through inclusive assessment environments.

Discussion and critical reflection

Students with ADHD often face executive functioning challenges that are inadequately addressed by traditional assessments. The ALIGN framework offers a practical, neuroaffirmative approach by aligning executive function needs with specific technological and assessment affordances. A significant insight from this work is that supports critical for executive functioning – such as chunked tasks and scaffolded feedback – are present in LMSs or portfolio tools, yet remain peripheral rather than integrated within assessment tasks. This systemic gap limits the effectiveness of inclusive practices. ALIGN addresses this by guiding educators to embed such affordances directly into assessment design, ensuring that supports are not only available but are intentionally aligned with learner needs across the whole educational experience.

By intentionally reducing barriers related to executive functioning, ALIGN enables a broader range of learners, including those with ADHD, to demonstrate strengths often overlooked by conventional assessments. Assessment is reframed from a neutral act of measurement to a deliberate design practice that values expression, engagement, and success for all learners. However, ALIGN's effectiveness depends on the capacity of educators and institutions to interpret, adapt, and implement its guidance within diverse disciplinary, technological, and cultural contexts. ALIGN balances necessary contextual flexibility with fidelity to core elements, and future research should clarify which components are essential versus adaptable to guide consistent and accurate implementation.

The framework's reliance on subjective practitioner reflection underlines the importance of triangulating its recommendations with student feedback, empirical learning outcomes, and contextual data. Without such iterative co-design and evidence-gathering, there is a

risk that ALIGN's affordance mappings may not fully capture lived experience or the dynamic complexities of neurodivergent learners. This highlights the need for ongoing professional development to help educators interpret, apply, and adapt ALIGN across diverse contexts.

While currently focused on executive functioning challenges common to ADHD, neurodivergence encompasses a broader spectrum of cognitive profiles (e.g., autism, anxiety-related executive differences) that may require further adaptations or expansions. Brown's (2006) six-cluster model includes Effort (regulating alertness, sustaining effort, processing speed) as a core executive function. In this framework, support strategies related to effort – such as pacing options, and cognitive load regulation – are incorporated within the Activation and Focus clusters. This integration encourages practical application while still aligning with Brown's model. Motivation and broader contextual factors remain areas for future development; however, including Communication and Interaction Supports as a complementary category allows ALIGN to address important social-executive challenges faced by neurodivergent learners.

Despite limitations, ALIGN offers significant potential to transform how educational technologies and assessment are conceptualised and designed. By centring lived cognitive diversity and aligning affordances with learner needs, ALIGN paves the way for neuroaffirmative practices that move beyond deficit-focused accommodation. Its application can inform institutional policies, shape procurement and curriculum decisions, and guide staff professional development aimed at systemic inclusion.

Empirical validation should begin with pilot studies in diverse courses, involving collaboration with neurodivergent students and educators. Mixed-methods approaches can assess affordance usability, alignment with learner needs, and promotion of agency, equity, and inclusion. Longitudinal and comparative studies between ALIGN-informed and traditional models are essential. Integration into AI-enabled platforms for real-time affordance mapping and adaptive alignment analytics (Al-Azawei et al., 2016; Doulou et al., 2025) could further enhance scalability, precision, and responsiveness.

In sum, ALIGN sits at the intersection of theory, practice, and policy, articulating a flexible yet purposeful path toward neurodiversity-affirming educational environments.

Conclusion

This paper introduces ALIGN, a theory-informed action-oriented framework designed to support inclusive assessment practices and educational technology use through the lens of executive functioning. Distinct from prescriptive models, ALIGN invites educators and designers to critically examine the intersection of cognitive needs, assessment formats, and technological affordances and reconceptualise assessment as a space for growth, creative expression, and equitable participation – recognising neurodiversity as a valuable dimension of educational practice.

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About the author

Dr Laura Tubino SFHEA is an educational innovator committed to transforming how assessment is conceptualised and implemented in higher education. Her research advances computing and STEM education by developing curriculum models that balance technical proficiency with holistic, student-centred learning. Grounded in constructive developmental theory, her work focuses on fostering learner agency, reflective practice, and inclusion – particularly through the integration of digital tools and assessment design. As a Lecturer in Curriculum Design at Deakin University, Laura collaborates with academics across disciplines to embed equity-focused, scalable teaching practices. She is widely recognised for her contributions to assessment reform, reflective learning, and educational technologies, leading impactful initiatives that connect research with institutional change. Her work has been celebrated nationally and internationally, including recognition by Universities Australia, Advance HE, and ASCILITE. Laura is passionate about empowering educators to teach in ways that enable students to thrive, supported by systems that make this possible.

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