



Inclusive Assessment Design for Neurodiverse Students in Multidisciplinary Programs

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Abstract

The expansion of neurodiversity within higher education has intensified the need to reconsider how academic assessment is designed, interpreted, and implemented across multidisciplinary programs. Conventional assessment systems frequently depend on timed examinations, extended written responses, compulsory presentations, inflexible group tasks, implicit performance expectations, and standardized modes of demonstrating knowledge. Although such practices may appear academically neutral, they can introduce construct-irrelevant barriers for students whose cognitive processing, executive functioning, communication, sensory regulation, attention, literacy, or social-interaction patterns differ from dominant expectations. Rather than treating inclusion primarily as an individual accommodation provided after a student discloses a diagnosis, the proposed model adopts a proactive design perspective informed by Universal Design for Learning, construct validity, accessibility, assessment transparency, learner agency, and neurodiversity-affirming pedagogy.

The study employs a structured conceptual synthesis of contemporary scholarship and a scenario-based assessment-design analysis. The scenario analysis indicates that proactive redesign can substantially strengthen accessibility and flexibility while preserving disciplinary standards and authentic learning outcomes. Importantly, inclusive assessment is not conceptualized as lowering academic expectations; instead, it aims to remove demands that are unrelated to the competence being assessed.

The paper further argues that multidisciplinary programs require particular attention because students may encounter sharply different assessment conventions across disciplines, increasing uncertainty and executive demands. The proposed framework therefore emphasizes consistent assessment communication, bounded choice, equivalent evidence standards, accessible group-work structures, multimodal demonstration of learning, staged feedback, and meaningful student participation in assessment design. The study offers a practical and theoretically grounded model that institutions can subsequently evaluate through participatory empirical research with neurodivergent students.

Keywords: neurodiversity; inclusive assessment; higher education; Universal Design for Learning; neurodivergent students; multidisciplinary education; assessment accessibility; learner variability; equitable assessment; student agency



1. Introduction

Neurodiversity has become increasingly significant within higher education because universities are educating students with a broad range of cognitive, attentional, communicative, sensory, and learning profiles. The concept commonly encompasses forms of neurological variation associated with autism, attention-deficit/hyperactivity disorder, dyslexia, dyspraxia, dyscalculia, Tourette syndrome, and related cognitive differences. Contemporary neurodiversity scholarship challenges purely deficit-oriented interpretations and instead recognizes that learning difficulties may emerge partly from a mismatch between an individual and the educational environment. Clouder et al.'s synthesis of higher-education research identified persistent questions concerning institutional inclusion, disclosure, teaching practices, and student support, while Hamilton and Petty subsequently argued for strengths-based and compassionate pedagogies rather than requiring neurodivergent learners continually to adapt to structures designed around a presumed “typical” student.

Assessment is one of the areas in which this mismatch becomes especially visible. Higher education traditionally relies on examinations, essays, presentations, laboratory reports, practical evaluations, group projects, oral examinations, and other standardized tasks. These formats can be academically appropriate when their demands directly represent intended learning outcomes. Problems arise, however, when performance depends heavily on abilities that are incidental to the construct being assessed. CAST's assessment guidance describes this distinction through construct relevance: an assessment may unintentionally measure additional abilities because of the way a task is presented or completed. Removing such construct-irrelevant barriers does not inherently reduce rigor; instead, it can improve the accuracy with which the intended knowledge or competence is assessed.

The issue becomes particularly complex in multidisciplinary programs. A student may move during the same semester from engineering problem solving to management presentations, reflective writing, statistical analysis, laboratory teamwork, field-based observation, or humanities-style argumentation. Each discipline can carry different assumptions about communication, time management, collaboration, acceptable evidence, academic writing, and professional behavior. For neurodivergent learners, repeatedly decoding these implicit expectations may add executive and cognitive demands unrelated to disciplinary knowledge.

Traditional accommodation systems remain important, but they are not a complete solution. Nieminen's critical analysis of disabled students' assessment experiences showed how assessment cultures can reproduce ablest assumptions when the standard design presumes an idealized learner and accommodations are added only after barriers have been created. These findings support a shift from reactive accommodation toward proactive assessment design while preserving individualized adjustments for circumstances that universal design cannot fully address.

2. Objectives of the Study

2.1 Development of an Inclusive Assessment Architecture

The first objective is to develop a structured model for redesigning assessment within multidisciplinary programs without weakening disciplinary standards. The study focuses particularly on distinguishing essential learning outcomes from incidental demands created by assessment format. In this model, inclusion is therefore treated as a question of assessment validity as well as accessibility.



2.2 Identification of Neurodiversity-Responsive Design Principles

The second objective is to identify design principles capable of reducing avoidable barriers associated with ambiguous instructions, rigid response formats, unnecessary time pressure, inaccessible group work, sensory demands, and inconsistent feedback. Particular attention is given to bounded learner choice, transparent criteria, multimodal expression, advance predictability, accessible technologies, and formative feedback.

2.3 Scenario-Based Evaluation Across Disciplines

The third objective is to examine how the proposed framework performs conceptually across different disciplinary assessment contexts. A scenario-based evaluation is therefore undertaken using common assessment configurations from STEM, social sciences, business, and health-related education. The comparison evaluates design quality rather than student achievement and does not represent observed clinical or educational outcomes.

3. Review of Literature

3.1 Neurodiversity, Participation, and Higher-Education Barriers

Research concerning neurodivergent learners increasingly emphasizes participation and environmental fit alongside individual support needs. Cloudier et al. synthesized the higher-education literature and demonstrated that neurodiversity encompasses multiple learner profiles rather than a homogeneous category. Davis, Watts, and Lopez's systematic review of firsthand experiences among autistic higher-education students similarly identified academic, sensory, social, communication and mental-health-related challenges and highlighted the significance of institutionally available support.

Their findings reinforce the significance of curriculum, environment, and institutional practice in shaping participation. Durgungoz and Durgungoz likewise found that neurodivergent student perspectives can materially inform curriculum design, including preferences for practical activity and forms of technology-mediated participation that reduce unnecessary exposure or social pressure.

3.2 From Assessment Accommodation to Inclusive Assessment Design

Assessment accommodations have historically included additional examination time, alternative rooms, assistive technology, deadline adjustments, or modifications to task presentation. Such measures remain essential for many learners. Nevertheless, research increasingly distinguishes individualized accommodations from anticipatory inclusive design.

Nieminen's analysis of assessment and disability demonstrated that even formally accommodated assessment systems may continue to privilege normative assumptions about how legitimate academic performance should appear. CAST similarly argues that assessment design should align methods with learning goals and reduce unnecessary barriers to access. A biology assessment, for example, should not unintentionally become primarily an examination of rapid essay production unless rapid written communication is genuinely part of the learning outcome



3.3 Multidisciplinary Assessment and the Remaining Research Gap

Multidisciplinary programs create an important but insufficiently resolved assessment problem because students must operate across different disciplinary cultures. An oral presentation may be considered central professional preparation in one subject, while written argumentation, numerical modeling, practical demonstration, group production, or laboratory performance may dominate elsewhere. An inclusive model cannot simply replace every assessment with unrestricted student choice because doing so could compromise construct equivalence and professional requirements.

Research on group work illustrates this tension. Salvatore and colleagues found that neurodivergent STEM students can experience group work differently depending on communication, organization, interpersonal dynamics, and task structure. Similarly, studies of presentations, anonymous technology-mediated participation, lecture capture, and reasonable accommodations indicate that flexibility is most useful when it is connected to clearly specified learning purposes rather than offered without boundaries.

4. Research Methodology

4.1 Research Design and Evidence Synthesis

The study adopted a conceptual-methodological design combining structured literature synthesis with scenario-based assessment analysis. It did not recruit human participants, administer questionnaires, or use institutional student records. Accordingly, the numerical results presented later are design-model scores generated for analytical illustration and are not empirical student-performance data.

The evidence base concentrated on scholarship addressing neurodiversity in higher education, inclusive assessment, Universal Design for Learning, autism and ADHD student experiences, disability and assessment, educational accessibility, assistive technologies, assessment accommodations, and participatory curriculum design. Priority was given to peer-reviewed studies and established educational-framework sources.

Studies were interpreted thematically across six recurring assessment-design dimensions:

- construct alignment;
- accessibility;
- response-mode flexibility;
- rubric and expectation transparency;
- cognitive and organizational load equity; and
- Disciplinary authenticity.

Table 1. Framework for Inclusive Assessment Design and Preservation of Academic Standards

Framework Dimension	Assessment Design Question	Example of Inclusive Application	Academic Standard Protected
Construct alignment	What competence is actually being assessed?	Remove unnecessary rapid writing from a conceptual science task	Accuracy of disciplinary knowledge
Accessible task	Can students understand and	Structured instructions,	Complexity of



entry	access instructions consistently?	accessible files, examples, advance schedules	required knowledge
Bounded response choice	Can equivalent evidence be demonstrated through more than one appropriate mode?	Written report or narrated analytical presentation where communication mode is not the construct	Equivalent learning outcomes
Transparent evaluation	Are expectations visible before performance?	Analytic rubric, model excerpts, explicit weighting	Consistency of grading
Load-equitable process	Are avoidable executive, sensory, or social demands minimized?	Milestones, predictable deadlines, defined group roles	Required intellectual workload
Authentic disciplinary evidence	Does flexibility remain compatible with disciplinary or professional competence?	Mandatory clinical demonstration where practical competence itself must be observed	Professional validity

Bounded choice is central to the framework. It differs from unrestricted choice because alternative modes are permitted only when each option provides equivalent evidence of the same learning outcome. For instance, if the intended outcome is critical interpretation of research evidence, a structured written analysis and an accessible recorded analytical presentation might reasonably be designed against the same rubric. Conversely, if spontaneous oral clinical communication is itself an essential competency, replacing it with an essay would alter the construct and would therefore require different justification.

4.2 Scenario Construction and Evaluation Procedure

Twelve hypothetical assessment scenarios were constructed across four broad multidisciplinary domains: STEM, health and applied sciences, social sciences, and business or management education. Scenarios included a timed examination, laboratory interpretation task, group design project, individual presentation, research critique, reflective task, case analysis, quantitative report, practical demonstration, interdisciplinary project, poster presentation, and capstone assignment.

Because this is a methodological simulation, the analysis does **not** establish effect sizes, statistical significance, improved grades, retention, or wellbeing among real neurodivergent students. Its function is to demonstrate how the framework changes the architecture of assessment and to generate hypotheses for subsequent empirical evaluation.

5. Analysis

5.1 Comparative Assessment-Design Profile

The scenario analysis revealed the largest design differences in accessibility, response-mode flexibility, and load equity. Conventional assessment configurations were not necessarily academically invalid; several scored comparatively well for disciplinary authenticity. Their principal weakness was that a single required format often bundled the intended academic construct with additional demands involving

speed, handwriting or extended writing, public performance, group negotiation, sensory tolerance, or rapid organization.

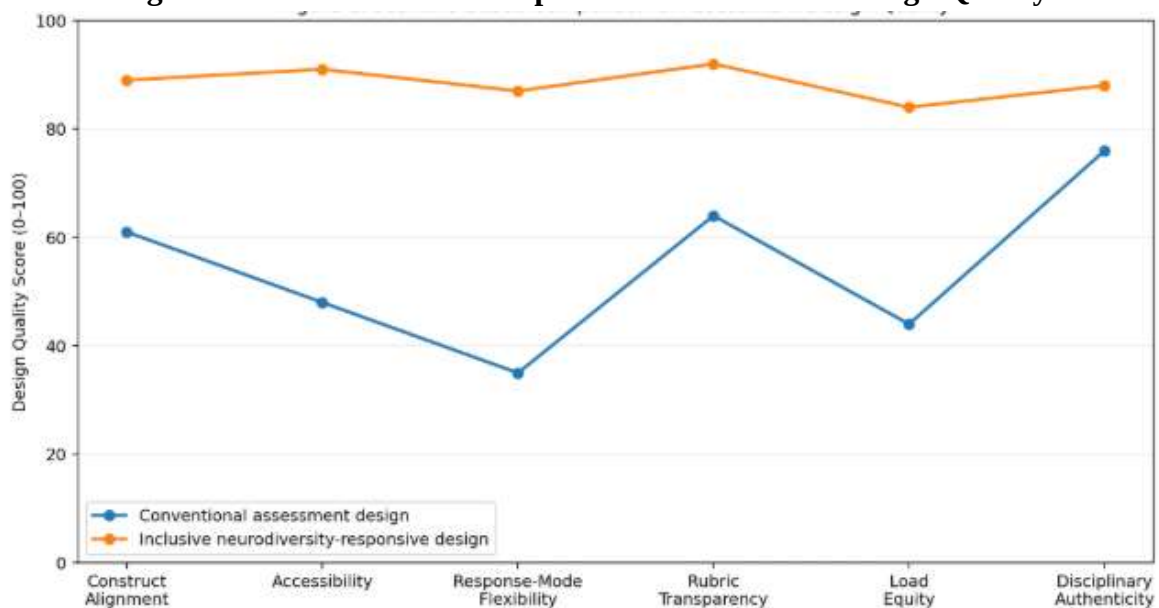
Table 2. Scenario-Based Comparison of Assessment Design

Evaluation Dimension	Conventional Design Score	IADF-MP Design Score	Difference
Construct alignment	61	89	+28
Accessibility	48	91	+43
Response-mode flexibility	35	87	+52
Rubric transparency	64	92	+28
Cognitive/load equity	44	84	+40
Disciplinary authenticity	76	88	+12
Mean design score	54.7	88.5	+33.8

The mean score increased from 54.7 under the modeled conventional configuration to 88.5 after inclusive redesign. The relatively smaller change in disciplinary authenticity is noteworthy: conventional assessments were often already grounded in recognizable disciplinary practice. Inclusive redesign therefore produced its greatest conceptual gains by removing incidental barriers rather than replacing disciplinary content.

5.2 Visual Comparison of Design Quality

Figure 1. Scenario-Based Comparison of Assessment Design Quality



The figure demonstrates that the proposed framework produces the strongest modeled improvements in response-mode flexibility and accessibility. Conventional assessment retains a comparatively high disciplinary-authenticity score, reinforcing the argument that inclusion should not be framed as



abandoning established disciplinary practices. Instead, the redesign process asks which components of those practices are essential to competence and which are merely customary.

Key analytical finding: The model suggests that the greatest opportunity for inclusive improvement lies in changing how evidence is elicited, rather than changing the intellectual level of the evidence required.

5.3 Application Across Multidisciplinary Assessment Types

A neurodiversity-responsive system requires different solutions for different constructs. A uniform rule stating that every student should always select any assessment mode would be academically weak. Instead, the IADF-MP proposes four levels of flexibility. Equivalent-mode flexibility can be used when the communication medium is not a learning outcome. A critical literature synthesis, for example, may potentially be demonstrated through multiple carefully standardized forms.

Process flexibility can be provided where the final product must remain identical. Students completing a laboratory report may all submit the same disciplinary output while receiving advance templates, staged milestones, accessible digital instructions, or planning tools. Participation flexibility is useful in collaborative learning. Group outcomes may remain compulsory while roles, meeting formats, communication channels, contribution records, and mechanisms for addressing overload are structured more explicitly.

6. Discussion

6.1 Inclusion as Assessment Validity Rather Than Reduced Rigor

A central implication of this analysis is that accessibility and rigor should not be treated as opposing educational goals. An assessment becomes less valid when performance is strongly influenced by skills unrelated to the stated learning outcome. CAST's construct-relevance guidance makes this distinction explicit, while Nieminen's research demonstrates how traditional assessment practices may privilege particular forms of learner behavior and performance.

The practical question for educators is therefore not “How can this task be made easier?” but rather “Which difficulty is academically necessary?” A demanding engineering assessment may legitimately require complex quantitative reasoning. It does not automatically need to require rapid handwriting, tolerance of a distracting examination room, or interpretation of vague instructions. Similarly, a sophisticated social-science assessment may require coherent argumentation and evidence appraisal while allowing flexibility in how intermediate planning and feedback occur.

This distinction helps protect academic standards because the framework explicitly retains essential competence. Inclusion becomes a mechanism for improving construct validity rather than a system for reducing intellectual expectations.

6.2 Student Agency, Transparency, and Predictability

The literature strongly supports greater attention to the lived experience and voices of neurodivergent learners. Durgungoz and Durgungoz found value in incorporating neurodivergent student perspectives into educational design, while Gillespie-Lynch and colleagues have argued for student-informed development of supports. Contemporary research further indicates that neurodivergent learners may



encounter institutional barriers involving disclosure, communication expectations, learning environments, and support navigation.

The IADF-MP consequently treats predictability as an important assessment feature. Predictability does not mean removing complexity. Rather, students should be able to identify what must be produced, how performance will be judged, what stages are involved, which deadlines are fixed, what choices exist, and which professional requirements are non-negotiable. Rubric transparency is especially important in multidisciplinary programs because grading conventions can shift sharply between courses. Explicit descriptors reduce dependence on implicit knowledge about what a particular discipline considers an “excellent” report, presentation, critique, design, or reflection.

6.3 Implications for Multidisciplinary Program Governance

Individual instructors can improve accessibility, but multidisciplinary consistency ultimately requires program-level coordination. If every module independently develops different terminology, platforms, deadline conventions, group-work rules, accommodation procedures, and feedback structures, neurodivergent students may continue to face substantial organizational demands even when each module appears inclusive in isolation. Program committees should therefore map assessment demands across the curriculum. Such mapping can identify unnecessary clustering of deadlines, repeated compulsory presentation requirements, inaccessible digital formats, inconsistent instructions, and cases in which similar learning outcomes are assessed through very different expectations without an educational rationale.

The present findings must nevertheless be interpreted within their methodological limits. The comparative scores are simulated design assessments rather than student outcome data. The framework has not yet been tested for reliability across assessors, disciplines, countries, or disability-support systems. Future studies should therefore use participatory research involving neurodivergent students, educators, disability professionals, and external examiners. Experimental or quasi-experimental evaluation could subsequently examine assessment performance, perceived fairness, workload, anxiety, accessibility, feedback use, academic integrity, satisfaction, and continuation while ensuring that subgroup differences are not concealed within an undifferentiated category of “neurodiverse students.”

7. Conclusion

Inclusive assessment for neurodiverse students requires more than the retrospective provision of individual accommodations. It requires deliberate examination of what an assessment intends to measure, which demands are essential to disciplinary competence, and which barriers arise only because of conventional task design. This paper proposed the Inclusive Assessment Design Framework for Multidisciplinary Programs as a construct-aligned model integrating accessibility, bounded response choice, transparent evaluation, cognitive-load equity, and disciplinary authenticity.

The study does not claim empirical effectiveness because no student participants were involved. Its principal contribution is therefore methodological: it converts broad commitments to neurodiversity and inclusion into specific assessment-design questions that can be reviewed, documented, and tested. Future empirical validation should place neurodivergent student voices at the center of this process and determine which combinations of flexibility, predictability, technology, feedback, and individualized



adjustment produce equitable outcomes in particular disciplinary contexts. Inclusive assessment should ultimately be judged not by whether every learner completes an identical task in an identical way, but by whether the assessment obtains valid, rigorous, and equitable evidence of the learning it claims to measure.

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