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Where does the thinking go? Distributed Epistemic Displacement and assessment design in the AI era

Why grades can stop measuring students when AI does the reasoning, and how universities can redesign assessment to keep the human mind in the loop.



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ABSTRACT

Generative AI can now produce essays, solutions and analyses that meet the visible criteria of most university assessments. This paper argues that the central problem is not cheating but *displacement*: AI redistributes epistemic agency, shifting where reasoning, justification and responsibility take place. When that shift is invisible, a grade can certify the work of a tool rather than the understanding of a student. Drawing on the framework of Distributed Epistemic Displacement (DED), the paper distinguishes three forms of displacement, sets out what each means for assessment validity, and proposes design moves that make the student's own thinking visible again. It then introduces the Displacement Audit, a ten-item self-check for course teams, and discusses implications for institutional quality assurance and for fair assessment of neurodivergent learners.

Keywords: generative AI; epistemic agency; assessment validity; academic integrity; higher education; quality assurance; inclusive assessment

01 Introduction: a measurement problem, not only a cheating problem

Most discussion of AI in universities has been framed as a question of academic integrity: how to detect AI-written text and how to punish its misuse. Detection is unreliable, and the framing hides a deeper issue. An assessment is a measurement instrument. It is valid when the evidence it collects supports the inference we draw from it, usually that *this student understands this material*. If a task can be completed well by a tool, the evidence no longer supports that inference, whether or not any rule was broken.

This paper therefore asks a different question. Instead of asking whether a student used AI, it asks *where the thinking happened*. The answer matters for every grade, transcript and degree a university issues, and it is the question the DED framework was built to address.

“The question is no longer whether a student used AI. It is where the thinking happened.”

02 From the extended mind to the displaced mind

Philosophers and cognitive scientists have long argued that human cognition does not stop at the skull. Clark and Chalmers (1998) proposed that notebooks and other tools can become part of a person's cognitive system. Hutchins (1995) showed that complex reasoning, such as navigating a ship, is distributed across people and instruments. Research on cognitive offloading (Risko & Gilbert, 2016) shows that people routinely move memory and computation into external tools, and that this changes what they retain themselves (Sparrow, Liu & Wegner, 2011).

These accounts describe *extension*: the tool adds capacity to a mind that remains in charge. Generative AI differs in one important respect. It does not only store or calculate; it produces reasons, arguments and judgements. When a student asks an AI system to explain, argue or decide, the act of reasoning itself can move outside the student. DED names this shift (Hussain, 2026; Hussain & Khan, 2026).

Distributed Epistemic Displacement (DED)

AI does not just extend human cognition; it redistributes epistemic agency, shifting where reasoning, justification and responsibility happen. The core question of DED is: *where does human knowledge and agency go when AI reasons?*

03 Three displacements

For assessment purposes it is useful to separate three things that can be displaced. Each can occur on its own, and each threatens validity in a different way.

Displacement of reasoning

The steps that lead from a question to an answer are carried out by the AI. The student receives a finished line of thought. The product may be excellent while the student's capacity to produce it is unknown.

Displacement of justification

The student may arrive at a position, but the reasons offered for it are generated rather than held. The student cannot defend, adapt or critique the argument without the tool. This is the gap a short viva exposes immediately.

Displacement of responsibility

Authorship becomes unclear. Neither the student nor the teacher can say which parts of the work the student stands behind. Responsibility for errors, sources and claims is diffused between the person and the system.

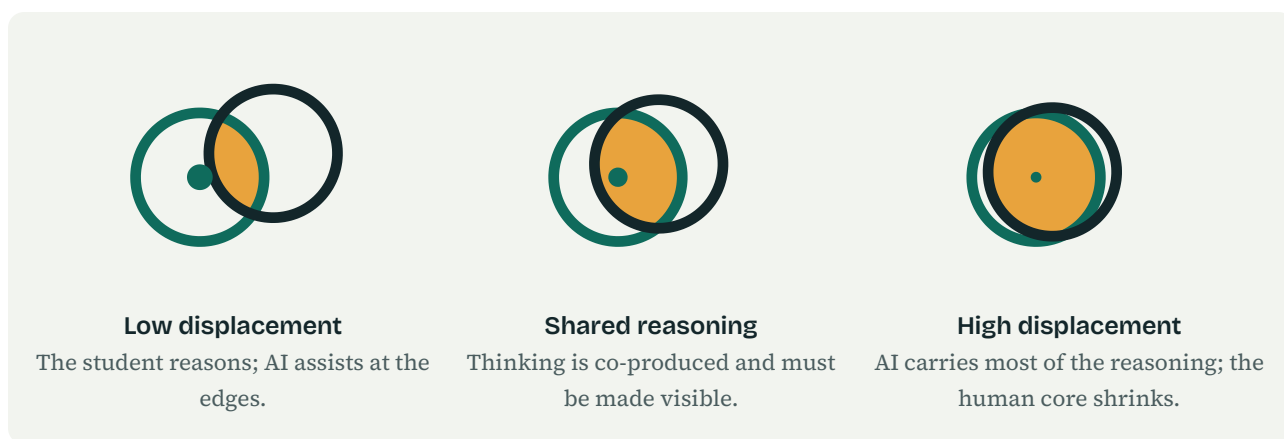


Figure 1. DED as overlap. The teal ring is the student's reasoning, the navy ring is AI reasoning and the gold zone is shared work. As displacement rises, the AI ring covers more of the student's ring and the human core becomes smaller.

04 What displacement means for assessment design

Assessment design has long relied on constructive alignment, the principle that tasks should require students to perform the learning the course intends (Biggs, 1996). DED adds a further test: *could the performance be supplied by something other than the student?* The table below links each displacement to the signal that reveals it and to a practical redesign move.

Displacement	Warning sign in an assessment	Redesign move
Reasoning	The task can be completed by pasting the instructions into an AI tool. The grade rests on the final product only.	Anchor tasks in local, personal or class-specific context. Award marks for plans, drafts and decisions, not only the end product.
Justification	Students are never asked to explain or defend their work in their own words.	Add a short viva, presentation or in-class explanation. Ask students to critique or adapt an AI-generated answer.
Responsibility	There is no clear AI policy for the task and no disclosure of tool use.	Publish a task-level AI-use policy. Require a brief AI-use statement describing which tools were used and what the student did.

None of these moves bans AI. The aim is not to keep AI out of learning, but to make sure the assessment still captures what the student contributes. In many courses the most valid design will invite open AI use while assessing the student's judgement about it.

“The aim is not to keep AI out of learning. It is to keep the student's mind in the evidence.”

05 The Displacement Audit

To make the framework usable by course teams, AOUNVA has developed the Displacement Audit, a ten-item self-check that a teacher completes for one assessment. Each item is scored 0, 1 or 2, giving a total from 0 (human-led) to 20 (AI-displaced). The items are grouped into four dimensions.

Reasoning Can the task be completed by AI alone? Does it require context AI cannot know? Is the grade based only on the product?	Process evidence Are drafts or reasoning steps collected? Is there a live element? Is any part supervised or timed?	
Responsibility Is there a written AI-use policy? Do students disclose and reflect on their AI use?	Fairness Does access to paid tools or internet affect the grade? Can students respond in more than one format?	
0–6 · Low The student does most of the thinking.	7–13 · Moderate Part of the reasoning can be handed to AI.	14–20 · High The grade may not show understanding.

The Audit is offered freely online as a first step. It is a reflective tool, not a validated psychometric instrument. Establishing its reliability and validity across disciplines is a priority for the Cognitive Lab's research programme.

06 Institutional and quality-assurance context

Universities everywhere work within quality-assurance structures, whether national agencies, accreditation bodies or internal quality units and faculty-development teams. These structures give institutions a practical route for change: assessment redesign can be built into course reviews, faculty training and programme self-assessment rather than left to individual teachers. DED-based redesign is designed to align with higher education institutions' requirements wherever they operate.

Three practical conditions deserve attention across contexts. First, large class sizes make live assessment harder, so designs must be efficient, for example short group vivas or sampled oral checks. Second, access to paid AI tools and reliable internet is uneven within and between countries, so assessment that rewards tool access risks widening existing inequalities. Third, institutions need guidance that is specific enough to act on. Aligning DED-based redesign with existing quality-assurance processes is a practical way to provide it. Higher education authorities and universities worldwide are now issuing policies on generative AI, among them UNESCO, the UK's QAA, Australia's TEQSA and Pakistan's Higher Education Commission (HEC, 2026), alongside the AI-use rules many universities have published for their own courses. This guidance points the same way. UNESCO calls for a human-centred approach that protects human agency when generative AI is used in education (Miao & Holmes, 2023). Quality frameworks already require that assessment lets students demonstrate the intended learning

outcomes (ENQA et al., 2015), and national agencies now advise redesigning assessment rather than relying on detection (QAA, 2023; Lodge et al., 2023).

07 Inclusion and neurodivergent learners

AI changes assessment for neurodivergent students in two directions. Tools can reduce barriers, for example by helping a student organise ideas or manage written expression. At the same time, redesigns that rely heavily on timed, oral or high-pressure formats can disadvantage autistic students and others who process information differently.

DED-based redesign should therefore offer choice of format, clear expectations and reasonable adjustments, while keeping the standard of understanding constant. This is a matter of education and fair assessment. It does not involve diagnosis, which remains the role of qualified clinicians.

08 Limitations and future research

This is a conceptual working paper. Its claims about displacement need empirical testing, including studies of how students actually divide reasoning with AI in different disciplines, and whether the redesign moves proposed here improve the validity of grades without reducing learning. The Displacement Audit needs piloting with course teams and formal validation. Research on how neurodivergent learners use AI as an epistemic partner is a further priority.

09 Conclusion

Generative AI has not made assessment impossible, but it has made unexamined assessment unreliable. DED offers a way to see the problem clearly: as a question of where reasoning, justification and responsibility now sit. Once that is visible, universities can design assessments that welcome AI as a tool while still certifying what their students understand. The goal is simple to state: keep the mind in the loop.

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