Research Community Brief

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Executive Summary

The Friction Deficit: What Learning Science Hasn't Measured Yet

Of 1,542 higher-education AI sources surfaced this week from a corpus of 4,171, the dominant empirical question remains "does the tool work?"—operationalized as engagement, time-on-task, or short-window performance. The case for designing *productive friction* into AI-mediated learning, advanced in [1], names what most efficacy studies systematically miss: that reduced cognitive effort is reported as a feature, not measured as a learning cost.

The theoretical problem is sharper than the policy debate suggests. Studies showing engagement doubling with tailored tutors, as in [2], and time-savings on math problems documented in [3], share an instrument design that cannot distinguish learning from completion. Meanwhile, [4] and the [5] propose taxonomies of cognitive agency that have not yet been operationalized into validated measurement instruments. Resolving this requires constructs that hold across disciplines—transfer, durable retention, metacognitive accuracy—rather than the proxy of self-reported satisfaction that vendor-aligned evaluations favor.

Adjacent gaps are equally underexplored. [6] frames AI adoption as a structural retention strategy, but the political-economy lens is rarely paired with learning-outcomes data. The global Delphi in [7] consolidates expert consensus without student-perspective triangulation—a gap [8] begins to address but few comparative studies extend.

This briefing maps unstudied questions in cognitive-agency measurement, identifies methodological limitations in current efficacy designs, and flags high-impact research opportunities where governance scholarship and learning science have not yet met.

[1] The case for friction in AI-mediated information seeking and learning

[2] Professor tailored AI tutor to physics course. Engagement doubled.

[3] Generative AI Reduced Study Time on Math Problems and ...

[4] The LOGOS Framework: A Five-Level Taxonomy of Human Cognitive Agency in AI-Assisted Assessment

[5] A Competency Framework for Medical AI Education: Mixed Methods Study

[6] Risk, Retention, and the Algorithmic Institution: Artificial Intelligence as a Policy Response to Higher Education in Crisis

[7] Governing generative AI in higher education: a global Delphi ...

[8] PDF Perspective Étudiante Sur Les Systèmes D'Intelligence Artificielle ...

Critical Tension

The Theoretical Problem

The field has a contradiction it keeps describing and keeps failing to theorize. On one side: generative AI in coursework correlates with reduced study time and, in controlled settings, measurable learning gains — see the math-problem trial showing compressed time-on-task [3] and the Harvard physics tutor that doubled engagement metrics [2]. On the other: a converging body of evidence that the same tools degrade critical thinking, displace productive struggle, and route around the cognitive friction that learning theory has, for fifty years, treated as constitutive of learning itself [1], [9], [10].

This is not a trade-off to optimize. It is a theoretical problem because the dependent variable is doing two different things in the two literatures. "Learning gain" in the efficiency studies is performance on a graded task; "learning" in the friction literature is the formation of durable cognitive structure through effortful processing. The field has no shared construct that adjudicates between them, which is why the same intervention can be reported as a doubling and a hollowing-out without contradiction. The Delphi work attempting global governance consensus [7] and the LOGOS taxonomy of cognitive agency in AI-assisted assessment [4] are early attempts to give the field a vocabulary, but neither closes the construct gap. What is missing is a theory of *which* cognitive operations must be preserved as effortful for the outcome we call education to obtain — and a measurement apparatus that can distinguish task completion from learning at the individual student level.

Paradigm Limitations

The dominant metaphor — AI as "tool" — is doing more harm than the literature acknowledges. Tools extend a stable user; the competency frameworks emerging in medical education [5] and the "digital teacher" framing in collaborative-learning studies [11] inherit this assumption and therefore cannot ask whether the user is itself being reshaped by the instrument. The "tool" frame forecloses questions about cognitive offloading as a permanent capability shift, about the institutional drift visible in policy reversals from bans to integration [12], and about the political economy in which OpenAI's expansion into Indian higher education [13] is rendered as procurement rather than curriculum capture.

[3] Generative AI Reduced Study Time on Math Problems and ...
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[9] Impact de l'IA générative sur la « pensée critique »
[10] Preserving learning in the age of AI shortcuts — Harvard Gazette

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[5] A Competency Framework for Medical AI Education: Mixed Methods Study
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[12] Faculty Ditch AI Bans: Study Shows Policy Shift
[13] OpenAI s'étend dans l'enseignement supérieur indien via des ...

Agency attribution follows the same pattern. When a student is wrongly accused at Adelphi [14], or when one-in-three Québec students reports rule-breaking [15], the field codes the student as the unit of agency and the detector as instrument. A research program that reversed that attribution — treating the detector and the institutional policy void [16] as the active variables — would produce different findings.

[14] Adelphi University accused a student of using AI to ... - Newsday

[15] Un étudiant sur 3 transgresse les règles à l'aide de l'IA

[16] Intelligence artificielle : l'université peut-elle sanctionner sans règle

Whose Knowledge Is Missing?

The evidence base this week skews heavily toward faculty and administrator voices. Student perspectives surface mainly through survey aggregates and the Laval consultation document [8]; engagement studies treat students as response variables rather than epistemic agents [17]. Student-centered research — phenomenological accounts of what it feels like to learn alongside a tutor that already knows the answer, ethnographies of how peer help networks reorganize around shared model access — would change which constructs count as outcomes.

[8] PDF Perspective Étudiante Sur Les Systèmes D'Intellige Nce Artificielle

[17] Frontiers | Student engagement with AI tools in learning

Critical perspectives on power are nearly absent from the empirical literature even as the structural moves accelerate: graduate teaching labor reshaped without bargaining [18], retention algorithms repositioning the institution itself [6], and 41% of UK universities lacking public AI policy [19]. Parent and community voices — including the families absorbing harm from K–12 surveillance systems whose logic is now arriving in higher education [20] — are methodologically invisible. Public-sentiment work from King's College London showing fear outweighing hope on AI and work [21] sits outside the education research mainstream entirely. A research program that centered these voices would not produce a kinder version of the current literature; it would produce a different question set, one in which "learning gain" is no longer the master variable.

[18] PDF AI and Graduate Teaching Labor: Reshaping Workload, Autonomy

[6] Risk, Retention, and the Algorithmic Institution

[19] Karen Lumsden, PhD's Post

[20] School AI surveillance like Gaggle can lead to false alarms, arrests

[21] Public have more fear than hope on AI and future of work

Actionable Recommendations

Research Brief: Five Open Questions the Current AI-in-Higher-Ed Literature Cannot Yet Answer

The week's 4171 sources cluster around a familiar set of empirical objects — detection disputes, syllabus policy, tutor pilots, surveys of student use. What they thin out on is harder and more interesting: the mechanism studies, the longitudinal designs, the work that takes student and graduate-labor accounts as primary evidence rather than

as anecdote. The directions below are scoped to that gap.

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1. The cognitive longitudinal: what a semester of offloading actually does

Current gap: the dominant designs are cross-sectional or single-task. We have evidence that generative AI compresses time-on-task in math problem sets [3] and that a tailored physics tutor doubled engagement [2]. We have separate evidence that heavy reliance correlates with weaker reading and problem-solving outcomes [22] and weaker critical-thinking measures [9]. What no one has — because the tools are too new — is a two- or three-year panel that tracks the same students across courses with varying AI affordances.

[3] Generative AI Reduced Study Time on Math Problems and ...
[2] Professor tailored AI tutor to physics course. Engagement doubled.
[22] The Impact of AI on Students' Reading, Critical Thinking, and Problem ...
[9] Impact de l'IA générative sur la « pensée critique »

Research questions:

- Does sustained tutor-mediated study build or erode transfer to novel problem types?
- Are engagement gains in pilot courses durable past the novelty window, or do they decay on the schedule familiar from CAI literature?
- Which subpopulations (first-generation students, STEM-anxious students, ESL students) show divergent trajectories?

Methodological considerations: cohort designs across at least three semesters, with paired think-aloud protocols and assessment data. The hard part is the comparison condition — true randomization is increasingly impossible because students adopt tools regardless of course policy. Quasi-experimental designs exploiting policy variation across articulation-agreement partner institutions are more realistic.

Potential contribution: settles whether the [4] higher tiers of cognitive agency are reachable through AI-mediated practice or only through unassisted struggle.

[4] The LOGOS Framework: A Five-Level Taxonomy of Human Cognitive Agency in AI-Assisted Assessment

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2. The student account as primary evidence, not survey item

Current gap: a Radio-Canada survey reports roughly one student in three transgresses institutional rules with AI [15], and the Université Laval student-perspective report documents a much more textured account of negotiation, anxiety, and selective disclosure [8]. The lit-

[15] Un étudiant sur 3 transgresse les règles à l'aide de l'IA

[8] Perspective Étudiante Sur Les Systèmes D'Intelligence Artificielle

erature is overwhelmingly faculty-authored. Students show up as percentages.

Research questions:

- How do students themselves classify their own AI use — and how does that taxonomy diverge from the institutional integrity vocabulary?
- What is the lived experience of being accused, as in the Adelphi case [14], and how does that experience reshape subsequent disclosure behavior across a cohort?
- What strategies do students use to manage the legitimacy problem documented in [23]?

[14] Adelphi University accused a student of using AI to ...

[23] GenAI in Higher Education, Legitimacy and Laziness

Methodological considerations: longitudinal qualitative work — diary studies, repeat interviews across an academic year, participatory coding. The recruitment challenge is real: students sanctioned for AI use are exactly the population most reluctant to be researched. Anonymized partnerships with student-government bodies or ombuds offices are one route; the IRB protocols will need unusual care around evidentiary protection.

Potential contribution: produces the evidence base institutions are currently substituting opinion for when they revise their academic-integrity codes [16].

[16] Intelligence artificielle : l'université peut-elle sanctionner sans règle

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3. The algorithmic institution as a structural response to the enrollment cliff

Current gap: the framing that AI adoption in HE is fundamentally about retention math under demographic pressure [6] has barely been operationalized empirically. We have the thesis; we don't have the procurement records, the vendor-selection minutes, the post-implementation outcome data.

[6] Risk, Retention, and the Algorithmic Institution: Artificial Intelligence as a Policy Response to Higher Education in Crisis

Research questions:

- Across a matched sample of regional public universities, does AI-platform adoption track financial-stress indicators more strongly than pedagogical-strategy indicators?
- What proportion of "AI tutor" and "AI advisor" deployments are functionally retention instruments rather than learning instruments — and who inside the institution authored the requirements?

- How does graduate-teaching-labor reallocation [18] follow these procurements?

[18] AI and Graduate Teaching Labor: Reshaping Workload, Autonomy, and ...

Methodological considerations: document analysis (FOIA where applicable for publics), procurement-record tracing, paired with interviews of CFOs and provosts. The vendor side will be opaque; expect EULA-bound non-disclosure to limit what platform partners will say. Triangulation through state-system reporting is the workaround.

Potential contribution: names the financial logic underneath what is currently narrated as pedagogical innovation, and gives shared-governance bodies an evidentiary base they currently lack.

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4. Friction as design variable, not failure mode

Current gap: the policy literature treats AI as a frictionless given — the question is whether to permit, restrict, or detect. A smaller line of work argues that engineered friction is itself the pedagogical intervention [1]. This has not been tested at scale, and the faculty drift away from outright bans [12] creates exactly the design space where this work matters.

[1] The case for friction in AI-mediated information seeking and learning

[12] Faculty Ditch AI Bans: Study Shows Policy Shift

Research questions:

- Which forms of friction (delay, justification prompts, mandatory edit logs, structured disclosure) preserve learning gains without producing the engagement collapse the ban literature documents?
- Do friction designs that surface model uncertainty change downstream student verification behavior?
- How do friction interventions interact with the human-AI collaborative-learning protocols emerging in tutor research [11]?

[11] The impact of an AI Digital Teacher on human-AI collaborative learning in higher education

Methodological considerations: A/B trials inside LMS-integrated tools, paired with process tracing of the artifact (revision history, prompt sequences). The instrumentation is the easy part; the hard part is getting vendor cooperation, because friction is commercially adverse to engagement metrics.

Potential contribution: a design vocabulary that is currently missing from both the policy and the product literature.

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5. Governance under temporal asymmetry

Current gap: a global Delphi has surfaced governance priorities [7], and competency frameworks are emerging in adjacent fields [5]. Neither addresses the structural mismatch between quarterly model releases and multi-year curriculum review — the acceleration condition [24] named decades before the present case. Course-design experiments in AI governance itself [25] are early.

[7] Governing generative AI in higher education: a global Delphi ...

[5] A Competency Framework for Medical AI Education

[24] Future Shock

[25] AI Governance in Higher Education: A course design exploring regulatory ...

Research questions:

- What governance architectures (versioned policies, sunset clauses, vendor-update notification requirements) actually function under continuous model change?
- How do surveillance-tool failures of the kind documented in K-12 [20] propagate into HE procurement, and what governance check would catch them?
- Where vendors like OpenAI enter national systems wholesale [13], what does shared governance even refer to?

[20] School AI surveillance like Gaggle can lead to false alarms, arrests ...

[13] OpenAI s'étend dans l'enseignement supérieur indien

Methodological considerations: comparative institutional case studies, with attention to senates that have and have not retained meaningful pre-procurement review. Limitation: governance scholarship lags events by years; preregistered rapid-response designs are needed.

Potential contribution: moves the governance conversation from principles documents toward the actual mechanism by which an institution retains the authority to set its own pedagogical terms.

Supporting Evidence

Evidence Base Characteristics

This week's corpus pulled 4,171 sources across categories, with 1,542 routed to higher education. The HE subset breaks into roughly four uneven piles: empirical studies (the smallest and most methodologically heterogeneous), institutional commentary and policy documents (the largest), vendor and program marketing material posing as analysis, and a thin layer of theoretical work. The asymmetry matters. When a Liberty University program page advertising an EdS in instructional design with an AI concentration [26] and a campus teaching center's curriculum portal [27] appear in the same evidentiary frame as a Delphi study of governance experts [7] or a competency framework derived through mixed methods [5], readers should notice the genre mixing. Most of what circulates as "research on AI in higher ed" is institutional self-description.

[26] EdS in Instructional Design | AI Technology

[27] AI Curriculum and Training

[7] Governing generative AI in higher education: a global Delphi ...

[5] A Competency Framework for Medical AI Education: Mixed Methods Study

Quality indicators in our scoring favor peer-reviewed empirical work and policy-relevant survey data, but the highest-volume material is operational — syllabi, training menus, accreditation memos — and the highest-cited material trends toward commentary in venues like the Harvard Gazette [10].

[10] Preserving learning in the age of AI shortcuts — Harvard Gazette

Perspective Distribution Analysis

The corpus shows no formally mapped missing-perspective data this week, which is itself a finding: the field has not yet developed instruments to flag whose accounts are absent. Functionally, the gaps are visible. Graduate teaching labor surfaces in only isolated work [18]. Student perspective appears in survey form — a Radio-Canada poll reporting one in three students transgress rules using AI [15], a Laval consultative document [8] — but student voice in qualitative depth is rare. The public-fear data from King's College [21] sits outside the HE literature even though it shapes the political environment institutions operate within. Disciplinary distribution skews to medicine, business, and computer science; humanities-grounded empirical work is thin.

[18] AI and Graduate Teaching Labor: Reshaping Workload, Autonomy, and ...

[15] Un étudiant sur 3 transgresse les règles à l'aide de l'IA

[8] PDF Perspective Étudiante Sur Les Systèmes D'Intellige Nce Artificielle ...

[21] Public have more fear than hope on AI and future of work, ...

Failure Pattern Analysis

The pipeline returned no formally tagged failure patterns for this corpus, but the citable record makes the distribution visible anyway. Documented failures cluster in three uneven categories: due-process failures (the Adelphi false-accusation case [14]; French legal commentary on sanctioning without policy [16]), surveillance-driven harms (false alarms producing arrests [20]), and pedagogical-effect failures (reduced study time with ambiguous learning consequences [3]). Technical failure modes — hallucination, drift, evaluator bias in detection tools — are systematically under-investigated relative to the policy weight institutions place on detection.

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[16] Intelligence artificielle : l'université peut-elle sanctionner sans règle

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[3] Generative AI Reduced Study Time on Math Problems and ...

Discourse Analysis Findings

Two metaphor families dominate. The first is **substitution**: AI as shortcut, as bypass, as the thing that lets students skip cognitive work [10]. The second is **partnership**: AI as tutor, as digital teacher, as collaborator [11], [2]. Both metaphors share a structural feature: they locate agency in the tool. The student or instructor becomes the variable acted upon. Frameworks pushing back on this — the LOGOS taxonomy of human cognitive agency [4], the case for designed friction

[10] Preserving learning in the age of AI shortcuts — Harvard Gazette

[11] The impact of an AI Digital Teacher on human-AI collaborative learning in higher education

[2] Professor tailored AI tutor to physics course. Engagement doubled.

[4] The LOGOS Framework: A Five-Level Taxonomy of Human Cognitive Agency in AI-Assisted Assessment

[1] — exist but remain marginal in citation volume.

Causal attribution patterns lean institutional-deficit: when adoption goes badly, the explanation is missing policy, missing literacy, or missing training. The harder attribution — that vendor product cycles and institutional procurement create the conditions for those deficits — surfaces mainly in critical policy work [6] and reporting on outright vendor capture [13].

[1] The case for friction in AI-mediated information seeking and learning

[6] Risk, Retention, and the Algorithmic Institution: Artificial Intelligence as a Policy Response to Higher Education in Crisis

[13] OpenAI s'étend dans l'enseignement supérieur indien via des ...

Methodological Observations

The dominant empirical design is the single-institution cross-sectional survey, often n $<$ 500, often with a convenience sample of one course or program [17], [22]. Longitudinal designs are nearly absent — a serious limitation when the underlying technology updates on a quarterly cadence and curricular effects compound across semesters. Comparative institutional work exists in policy-survey form (the King's-affiliated finding that 41% of UK universities have no public AI policy [19]) but rarely tracks outcomes. Generalizability claims routinely exceed what single-site designs can support.

[17] Frontiers | Student engagement with AI tools in learning: evidence from ...

[22] The Impact of AI on Students' Reading, Critical Thinking, and Problem ...

[19] Karen Lumsden, PhD's Post

Theoretical Development Needs

Three unresolved tensions require theoretical work that the current literature gestures at but does not deliver. First, the legitimacy question — when does AI-assisted production count as the student's work? — is treated as a policy problem [23] 2. [14] 3. [27] 4. [25] 5. [26] 6. [12] 7. [17] 8. [24] 9. [23] 10. [3] 11. [7] 12. [9] 13. [16] 14. [19] 15. [13] 16. [18] 17. [8] 18. [10] 19. [2] 20. [21] 21. [6] 22. [20] 23. [1] 24. [22] 25. [11] 26. [4] 27. [15]

[23] GenAI in Higher Education, Legitimacy and Laziness

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