

Scholarship of Teaching & Learning (SOTL): Learning Challenges at LUMS

Project title	Rekindling deep learning: Addressing the decline of critical thinking and attention span in the digital age
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Policy audience	VC Council / Dean's Council / Registrar / Provost
Decision requested	Policy revision / Further Study

1. Executive Summary

Across faculties at LUMS, instructors report shorter student attention spans, weaker engagement, and growing reliance on AI tools as substitutes for direct engagement with course material. This brief reports on a six-week intervention in Fall 2025 across seven sections of Principles of Management Accounting (ACCT130), testing a bundle of three low-cost classroom practices: Pomodoro lecture cycles, in-class device restriction, and active recall exercises. Using a section-level randomized classroom intervention, and estimating effects through a baseline-adjusted Difference-in-Differences framework with assessments mapped to Bloom's Taxonomy, the study finds that treatment students scored 3.9 percentage points higher on overall midterm performance ($p < 0.05$) and 6.3 percentage points higher on Applying-level questions ($p < 0.01$) during the intervention period. Effects were larger for higher-CGPA students. However, treatment effects on later assessments were not statistically significant, suggesting that a six-week single-course intervention can improve performance during the intervention window but is insufficient, on its own, to produce durable changes in learning habits.

The evidence from this study suggests that learning conditions matter: when classroom time is intentionally structured around attention, retrieval, and application, students engage more deeply and perform better on cognitively demanding tasks. The evidence points to four central institutional implications:

- instructional practices shape learning quality;
- assessments strongly determine how deeply students engage with course material;
- unmanaged digital distraction is increasingly undermining sustained learning; and
- deep learning cannot be rebuilt through isolated classroom interventions

The brief therefore recommends institution-wide strengthening of constructive alignment, wider adoption of structured in-class pedagogies, coordinated faculty approaches to device use and assessment design, and sustained faculty development around deep learning in the age of AI and digital distraction.

2. Why This Matters Now

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Faculty across LUMS increasingly report that students are arriving in classrooms less prepared, less attentive, and less willing to engage deeply with course material. Students frequently skip readings, rely on summaries instead of sustained engagement with texts, and struggle to maintain attention during extended analytical tasks. Long-form writing, note-taking, and conceptual discussion have also weakened, resulting in classrooms with widely varying levels of preparedness and declining capacity for higher-order reasoning. These reflect a shift in academic culture that is directly undermining the quality of learning at LUMS. These are not isolated observations. Digital distractions¹ and AI tools² are accelerating this shift, with recent evidence suggesting both are measurably degrading the deep learning habits that higher education is meant to build. Deep learning is the capacity to actively comprehend, make conceptual connections, and transfer knowledge to unfamiliar problems (Biggs, 1987).

Instead, we find that more students are relying on surface learning that focuses on passive absorption, rote recall, and reproducing what was shown. The challenge for LUMS is therefore no longer simply how to transmit content, but how to rebuild the conditions necessary for deep learning. In practice, this requires sustained attention, active retrieval, reflection, and cognitive engagement over time. This study was accordingly designed to test whether instructional interventions could measurably improve deep learning outcomes of students.

3. Intervention and Method

This study tested whether structured, low-cost, in-class interventions could produce measurable improvements in deep learning outcomes. Alongside course assessments data, behavioral evidence was collected through baseline and endline surveys tracking study habits, classroom engagement, and self-regulation with focus group discussions providing qualitative depth on how students experienced the intervention and what they identified as the primary barriers to sustained learning.

The study was conducted over six weeks, pre-midterm, across seven sections of ACCT130: Principles of Management Accounting during Fall 2025, involving 347 undergraduate SDSB students. ACCT130 is a core course taken by both ACF and MGS major students in their sophomore year. In the context of ACCT130, deep learning is defined as the ability to interpret, analyze, and evaluate accounting results (higher order cognitive skills). Three sections (164 students) received the structured intervention (treatment); four (183 students) continued with standard instruction (control). Treatment and control sections were taught by different instructors, both of whom have taught ACCT130 previously using the same course material. Quiz 1 served as a baseline assessment administered before the intervention began, with no statistically significant performance difference across all sections. Both instructors used identical in class and out of class learning materials freely provided to students, and sections ran concurrently on the same teaching days and time slots.

The intervention combined three strategies:

1. Pomodoro lecture cycles: Structured attention intervals followed by device-free breaks to

¹ OECD (2023). *PISA 2022 Results (Volume II): Learning During – and From – Disruption*. OECD Publishing. <https://doi.org/10.1787/a97db61c-en>

² Kosmyrna, N., et al. (2025). "Your brain on ChatGPT: Accumulation of cognitive debt when using an AI assistant for essay writing task." arXiv preprint arXiv:2506.08872

improve sustained focus during class

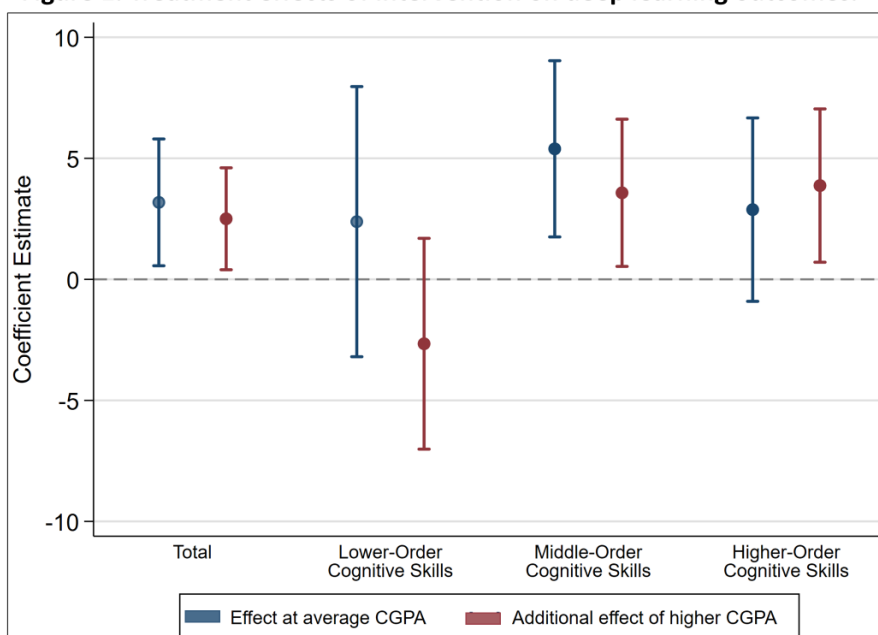
2. Device restriction: Reduced digital distraction during instructional time and breaks
3. Active recall exercises: Retrieval-based learning to reinforce retention and understanding of concepts covered the same day

Student learning was measured using performance on quiz 1 (baseline), quiz 2, and midterm examinations. Since the study sought to produce measurable improvements in deep learning outcomes, assessment questions were mapped to Bloom's Taxonomy across three cognitive levels: lower-order skills (Remembering and Understanding), middle-order skills (Applying), and higher-order skills (Analyzing and Evaluating). This mapping allowed the study to determine not only whether performance improved, but at which level of Bloom's Taxonomy. About 40–50% of assessment questions in this course were set at the Applying Level. All scores were standardized to a percentage scale (out of 100) to allow comparison across assessments and cognitive levels.

4. Key Findings

a. Structured classroom interventions work

Figure 1. Treatment effects of intervention on deep learning outcomes.



The coefficient plot shows percentage-point score gains for students in the treatment group relative to controls. Gains at Lower-Order cognitive skills were not statistically significant. Lower-order = Remembering & Understanding; Middle-order = Applying; Higher-order = Analyzing & Evaluating. Error lines show 90% confidence intervals.

who showed larger improvements in middle (effect size = 3.58, $p < 0.10$) and higher-order (effect size = 3.87, $p < 0.05$) reasoning questions as indicated in Figure 1. Higher than average CGPA students outperformed control students at the middle order cognitive skills (effect size = 3.58, $p < 0.10$) and higher order cognitive skills, specifically at the Evaluating level (effect size = 6.56, $p < 0.05$).

Structured classroom interventions produced measurable improvements in deep learning outcomes. As indicated in Figure 1, treatment students scored 3.87 percentage points significantly higher in overall assessments³ ($p < 0.05$). The impact was strongest on middle-order/Applying-level questions with students exposed to instruction that supported deep learning, scoring 6.26 percentage points higher on assessments than their control counterparts ($p < 0.01$). Performance gains were concentrated among academically stronger (higher-CGPA) students,

Overall assessment refers to the combined scores from Quiz 2 and Midterm scores, retaining only questions on content covered during the intervention period.

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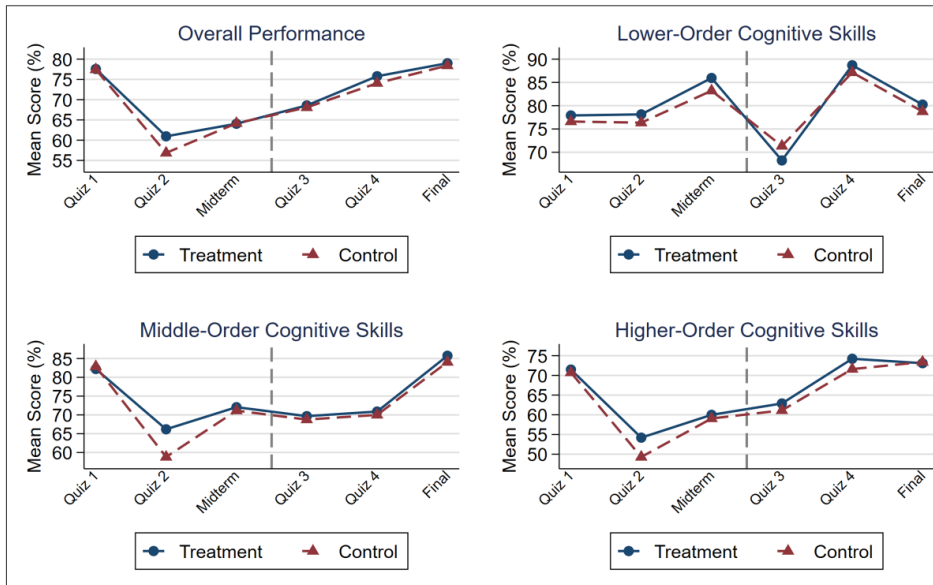
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b. Classroom-level change did not extend beyond the classroom.

Figure 2. Persistence of treatment effect across all assessments



Lines show mean assessment scores (%) for treatment and control groups across six assessments. The vertical line between midterm and quiz 3 marks the end of the structured classroom intervention. Convergence of the two lines after this point indicates that gains did not persist once the intervention was ended.

As shown in Figure 2, the effects of the in-class interventions on assessment performance were concentrated within the intervention window. There was no statistically significant impact of the treatment on performance on post-midterm assessments such as Quiz 3, Quiz 4, and the Final. This is corroborated by data from the baseline and endline surveys. While students in the treatment group self-reported greater engagement with classroom practices during the

intervention (Pomodoro cycles, device restriction, and active recall exercises), this did not translate into lasting change. Baseline-adjusted analysis of self-regulation, cognitive engagement, self-efficacy, and perceived learning showed no significant difference between groups by endline. This suggests that the intervention shifted what students did in class but did not produce measurable change in broader learning attitudes or dispositions. Therefore, the performance gains did not persist beyond the intervention period.

c. The conditions shaping student learning are institutional, not solely individual.

Endline survey results showed that students most frequently identified workload and competing course demands (55%), limited subject interest (42%), and digital distraction (40%) as the primary barriers to deeper engagement. Focus group discussions further revealed that students calibrated the depth of their study effort according to what they expected assessments to reward. Taken together, these findings suggest that assessment design, workload structures, and classroom expectations are key institutional factors shaping how deeply students engage with learning.

5. Policy implications

a. Constructive alignment is a core institutional quality mechanism

Findings 1, 2 and 3 suggest that if assessments are not aligned to learning outcomes, pedagogical improvements alone will not produce the depth of engagement LUMS intends. Assessment design is an institutional lever over the quality of student learning, and it should be used systematically.

b. Structured in-class practices should be adopted across courses to improve students' deep learning

outcomes

Finding 1 showed that Pomodoro lecture cycles, active recall exercises, and restricted device use demonstrably improved students' performance in the treatment group. Such structured practices are transferable across courses and disciplines and should be encouraged in alignment with what each course is designed to achieve. Deep learning must therefore be approached as an institution-wide academic culture challenge rather than a stand-alone classroom innovation.

c. Short-span interventions change in-class behavior; sustained habit change requires institutional coordination across all courses.

Six weeks of structured classroom intervention shifted in-class behavior and improved student performance. However, finding 2 showed that performance gains did not persist beyond the intervention window. This suggests that students need repeated exposure to structured learning practices across multiple courses and semesters before those practices become habits. One course alone cannot achieve that. Moreover, courses shape learning habits early and reach large numbers of students. The schools may work together to scale these practices across undergraduate courses to produce the sustained improvement in student learning quality it intends.

d. Workload structures sit upstream of pedagogy and assessment

Finding 3 suggests that workload pressure is what drives students to substitute AI summarization for direct engagement with course material. Pedagogical and assessment changes will have limited reach if cumulative course load and competing deadlines are not also addressed. Further study may be conducted to understand the current workload at school level.

6. Recommendations

Recommendation	Lead owner	Timeline	Resource implication	Risk if not acted upon
Constructively align assessments with learning outcomes. (Policy Implication 1)	School Deans, HODs, Faculty, LLI	Continuous, pertaining to course design stage	Medium Faculty time and encourage capacity building program (FCTL)	If assessments are not aligned with learning outcomes, pedagogical improvements will not translate into the desired engagement and learning behaviour.
Adopt structured in-class pedagogy practices across all undergraduate courses	School Deans, HODs, Faculty	Continuous, pertaining to course design		Learning gains remain confined to courses or intervention periods,

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in line with each course's learning outcomes. (Policy Implications 2 and 3)		and delivery stage		with no institutional consistency or scale.
Implement a tiered device policy restricting non-instructional application to use during class. Enforced through campus WiFi configuration and geocoding tags and a communicated institutional norm ⁴ to preserve device use where it supports learning. (Policy Implication 2)	IST Services, Faculty	TBD – requires IST input	Low WiFi configuration on existing infrastructure	Digital distraction continues to erode in-class focus, and individual instructors remain solely responsible for managing it without institutional backing.
Data collection and review to understand the current student workload at school and academic level. (Policy Implication 4)	School Deans, HODs, PCO, in collaboration with Faculty. LLI could provide support if needed	12 weeks	Medium Cross-school coordination, Faculty onboarding	Pedagogical and assessment reforms will have limited reach if cumulative course load continues to push students toward surface-level shortcuts rather than deep engagement.

7. Implementation considerations

- a) Faculty buy-in:** The faculty who delivered the intervention had volunteered for an LLI study, and their commitment was integral to the result. The institution-wide scaling will not be a function of policy direction alone; it will depend on whether the institution makes adoption feasible for every instructor, through protected time for course redesign, teaching assistant support during delivery, and recognition of pedagogical work in processes pertaining to promotion and teaching-evaluation.
- b) Assessment mapping and redesign Constructive alignment** requires faculty time to review, map, and redesign assessments. Without protected time and TA support built into workload planning, this exercise will not achieve its intended outcomes.
- c) Piloting before scaling:** Deep learning will look different across disciplines. Schools should

⁴ LUMS should consider moving toward clearer institutional norms, for example i. device-free by default for lecture, discussion, and reflection-heavy sessions; ii. device-enabled where technology serves a defined instructional purpose; iii. restricted non-instructional use during class time

therefore adapt structured pedagogical practices to their disciplinary context while working within a common framework around learning quality and higher-order cognition. Structured practices should be piloted in at least one course per school before institution-wide rollout.

- d) *Device policy enforcement:*** Wi-Fi restrictions apply to campus network traffic only, and students on mobile data are unaffected. The core issue is unmanaged distraction, not technology itself. Some disciplines require extensive device-based learning. Institutional policy should therefore support intentional and pedagogically justified technology use. The institutional norm is as critical as the technical measure and must be consistently communicated across faculty and students.