Advances in Consumer Research
https://acr-journal.com/
Volume-3 | Issue-6 |June: 2026

Original Researcher Article

Rethinking The Classroom In The Age Of Artificial Intelligence: Why Analytical And Application-Based Learning Is The Sustainable Path Forward An Empirical Study Of Faculty Perceptions And Student Learning Behaviors

Ms. Isha Narvekar
DES's Jayshree Sharadchandra Kothari Business School.
Email:ID: isha.narvekar@despune.org

ABSTRACT
Generative artificial intelligence has reshaped how learners access information, prompting a fundamental re-examination of what constitutes meaningful education. This study investigates whether analytical and application-oriented learning retains — or amplifies — its pedagogical value when conceptual knowledge is instantly accessible through AI tools. Based on primary data collected from 78 students participating in post-graduate management and commerce programs and 25 faculty members, the study finds a strong and convergent preference for applied learning in both groups. Students rate real-world examples as their highest engagement trigger (4.64/5), but faculty observations based on responses show that student engagement in application-based sessions (mean score 4.44/5) significantly exceeds engagement in concept-delivery sessions (3.92/5). Crucially, compared to written theoretical exams, 94% of students favor practical, case-based, or hybrid grading methods. In contrast to the notion that AI encourages cognitive passivity, 69% of students actively participate in comprehending explanations after receiving prompt responses. Together, these results bolster a key claim: analytical learning is not just adaptable to the AI era but also the most sustainable approach to education. A number of evidence-based recommendations for curriculum redesign and assessment reform are made in this study

Keywords: Analytical Learning, AI in Education, Application-Based Pedagogy, Student Engagement, Generative AI, Higher-Order Thinking, Management Education, Assessment Reform.
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INTRODUCTION:

Education has always evolved in response to shifts in how knowledge is produced, stored, and transmitted. The printing press redistributed textual knowledge; the internet democratised access to information; and now, large language model-based AI systems have gone a step further — they can retrieve information along with synthesising, explaining, and even generating it on demand. This shift introduces a question of existential significance for educational institutions: when a student can obtain a coherent explanation of any concept within seconds, how can one uniquely deliver valuable formal learning?

The answer, this paper argues, lies not in the content that AI can replicate, but in the cognitive processes it cannot. Critical reasoning, contextual judgment, the ability to evaluate competing arguments, and the capacity to apply knowledge creatively in novel circumstances — these are competencies that emerge from analytical engagement, not passive reception. They are, moreover, the competencies that contemporary employers identify as the most consequential for professional performance in AI-integrated workplaces.

This paper presents empirical evidence in support of this argument, drawn from primary data collected through survey across two cohorts: 25 faculty members from management and commerce disciplines, and 78 students enrolled at the post-graduate level. Together, these datasets offer a dual-lens view of learning in the AI era — how educators observe it unfolding, and how students report experiencing it from the inside. The convergence between the two perspectives is striking, and it points unambiguously in one direction: towards the urgent primacy of analytical and application-based education.

2. THEORETICAL CONTEXT

The intellectual foundations of analytical learning trace back to constructivist traditions in educational psychology. Piaget's account of knowledge construction through active engagement, and Vygotsky's emphasis on collaborative sense-making, both anticipate the modern argument that understanding is built, not merely received. Bloom's Revised Taxonomy (Anderson and Krathwohl, 2001) operationalises this idea by distinguishing between lower-order cognitive tasks — such as remembering and understanding — and higher-order tasks involving analysis, evaluation, and creation. Analytical learning, as theorised here, is centred on the upper registers of this taxonomy.

The distinction between surface and deep learning approaches (Marton and Saljo, 1976) further sharpens this framing. Surface learners interact with the content instrumentally, replicating it for evaluation without truly understanding it. By relating new information to past experiences and putting it to the test in practical settings, deep learners strive for intrinsic understanding. Deep engagement yields better long-lasting and transferable learning outcomes, which are exactly what important when AI can manage surface-level knowledge retrieval, according to numerous studies.

The specific context of generative AI offers two new theoretical elements pertinent to our study. Initially, a cognitive reallocation effect occurs: as AI systems do lower-order cognitive activities, the resulting pedagogical space should be filled with higher-order analytical activity. Secondly, there is a necessity for analytical verification: while AI-generated information may be articulate yet factually inaccurate, learners must cultivate the crucial skills to scrutinize, contextualize, and rectify AI outputs. Both interactions reinforce, rather than undermine, the argument for analytical pedagogy.

3. METHODOLOGY

Two structured questionnaires were developed and administered digitally. The Faculty Perception Survey comprised items assessing observed student engagement patterns, learning modality preferences, longitudinal behavioural shifts, and faculty judgements of student preparedness. The Student Learning Behaviour Survey assessed self-reported approaches to new topics, classroom engagement triggers, assignment preferences, evaluation preferences, and analytical habit indicators including source verification, curiosity depth, and adaptive reasoning.

Likert-scale items used a five-point frequency continuum. Categorical items explored specific behavioural choices. Ordinal scores were converted to a common 1-5 scale for comparative analysis, with higher scores indicating greater frequency or strength of the measured attribute. The faculty sample (n=25) was drawn predominantly from post-graduate management programmes, with teaching experience ranging from early career to 16 years and above. The student sample (n=78) consisted predominantly of post-graduate students aged 21 to 24, spanning management, commerce, and business management streams. While the sample size is modest, the dual-perspective design and the consistency of findings across independent instruments strengthen interpretive confidence.

4. FINDINGS

4.1 Faculty Observations: Engagement and Participation

When faculty rated the frequency with which students engage with conceptual content versus application-oriented content, a clear and consistent gap emerged. Across multiple indicator items — including classroom questioning behaviour, topic introduction responses, and session participation — application-oriented engagement scored a mean of 4.16 on a 5-point scale, compared to 3.50 for conceptual engagement. This 0.66-point differential, observed independently by 25 experienced educators, constitutes one of the most robust signals in the dataset.

The participation data reinforces this pattern. Faculty reported that sessions structured around case studies, problem-solving, and real-world application generated participation levels averaging 4.44, while concept-explanation sessions averaged 3.92. The implication is practically significant: not only do students engage more deeply with applied content in principle, but this preference manifests visibly in the classroom in ways that experienced teachers can observe and report consistently.

Table 1: Faculty-Observed Engagement Comparison (n=25, scale 1–5)

Dimension	Conceptual Score	Application Score	Gap
Student Engagement (Faculty Observed)	3.50 / 5	4.16 / 5	+0.66
Session Participation (Faculty Observed)	3.92 / 5	4.44 / 5	+0.52

4.2 Student Behavioural Shifts as Observed by Faculty

Faculty with multi-year teaching experience were uniquely placed to identify longitudinal shifts in student behaviour. All four of the shift indicators that were evaluated had scores in the moderately high to high range, indicating that noticeable changes had taken place throughout the course of a professional teaching career.

The most noticeable change was a greater focus on results rather than process (3.96), which was closely followed by a desire for quick understanding (3.88) and a lack of tolerance for theoretical explanation (3.84). These three tendencies align with the behavioral signature of students working in an AI-rich setting, where lengthy theory lessons may seem unnecessary and quick answers are readily available. However, instructors also noted a significant rise in pupils posing analytical questions of the how and why type (3.40). This coexistence of sincere curiosity and shortcut-seeking is a complex discovery that defies easy interpretation.

The simultaneous rise in outcome-focus and analytical questioning suggests a student cohort in transition: one that has internalised AI's utility for factual retrieval and is consequently redirecting intellectual energy toward questions that AI cannot resolve — questions of application, judgement, and reasoning.

4.3 Real-World Preparedness: A Faculty Perspective

Perhaps the most urgent finding from the faculty dataset concerns student readiness for professional problem-solving. On a five-point scale, faculty rated the average student's preparedness for real-world challenges at just 2.56 — a score that places the majority below the midpoint. Nearly half of all faculty respondents (48%) rated student preparedness at the two lowest levels. Only one respondent in 25 rated it at the maximum.

Table 2: Faculty Rating of Student Real-World Preparedness (n=25, mean = 2.56)

Preparedness Rating	Faculty Count	Percentage
1 — Very Low	5	20%
2 — Below Average	7	28%
3 — Average	8	32%
4 — Above Average	4	16%
5 — Excellent	1	4%

This finding must be contextualised carefully. It does not imply that students lack capability — subsequent student data suggests otherwise. Rather, it points to a structural gap between the competencies that current educational models develop and the competencies that real-world settings demand. When the dominant pedagogical mode prioritises conceptual delivery and theory-based evaluation, the result is graduates who are informed but underequipped for the ambiguous, application-heavy demands of professional life.

4.4 Student Learning Orientations

The student dataset provides a revealing self-portrait of how contemporary learners approach their own education. When asked how they naturally engage with new topics, the two highest-scoring approaches were looking for real-life examples and applications (4.53) and seeking definitional understanding (4.51) — essentially tied. Three of the four approaches measured were analytically oriented, with an aggregate mean of 4.18, compared to 4.51 for the single conceptual indicator.

This pattern challenges a common assumption — that students today are primarily passive or conceptually disengaged. The data suggests instead that they are active learners who want to understand, but who orient instinctively toward contextual meaning and real-world relevance as their primary route into new material. Conceptual grounding is not rejected; it is sought in parallel with, rather than prior to, application.

4.5 Classroom Engagement: What Works

Students were asked to rate how engaged they feel under four different classroom conditions. The highest engagement trigger by a meaningful margin was the use of real-world examples by faculty, scoring 4.64 — the single highest metric across the entire student dataset. This was followed by detailed concept explanation (4.35), participation in activities and problem-solving (4.33), and being invited to analyse situations (4.00).

Real-world examples outperformed every other classroom stimulus, including activities, analysis tasks, and concept explanation. For educators, this is an actionable design signal: begin with relevance, build with rigour.

The aggregate of the three application-oriented triggers averages 4.32, compared to 4.35 for conceptual explanation — a near-negligible difference. What this means practically is that students do not prefer application instead of concept; they want both, but they want application to lead. The sequence and framing of content matters as much as the content itself.

4.6 Assignment and Evaluation Preferences

Student preferences for assignment and evaluation types produced one of the study's starkest findings. Real-life problem-solving tasks were the most preferred assignment type at 4.44, followed by open-ended projects (4.03) and case studies (3.97). Theory-based questions scored 3.37 — a full 1.07 points below the top preference. The hierarchy is unambiguous.

Table 3: Student Assignment Preference by Type (n=78, scale 1–5)

Assignment / Evaluation Type	Mean Score (1-5)	Category
Real-life problem-solving tasks	4.44	Applied
Open-ended projects	4.03	Creative-Applied
Case studies	3.97	Structured-Applied
Theory-based questions	3.37	Conceptual

Evaluation preferences were even more pointed. When asked to identify their preferred form of assessment, 53% of students chose a combination of evaluation methods, 27% chose practical projects, and 14% chose case analysis. Just 6% — five out of 78 students — selected written theoretical examinations as their preferred evaluation format. Across the combined applied categories, the preference ratio against theory-only exams is 15:1.

4.7 Analytical Depth: Behaviour When Answers Are Accessible

The most theoretically consequential item in the student survey asked what students typically do after obtaining quick access to an answer or explanation — the exact scenario replicated by AI tool use. The findings dispel common concerns over passive AI dependence: 69% of students reported reading to comprehend the explanation, and 12% reported trying to apply it to related topics. Just 5% did not interact with the content and went straight to the next topic.

When given simple responses, 81% of pupils show understanding-oriented or application-oriented behavior, which is significantly higher than what opponents of AI in education may anticipate. According to the findings, most students in this cohort have an innate desire to understand information rather than just gather it.

This is reinforced by the fact that students' most common method of addressing problems was to comprehend the underlying logic of a solution (54%), followed by experiment with different approaches (14%), and connecting difficulties to real-world situations (13%). Merely 19% choose to adhere to a recognized procedural approach by default. This student body seems to have a sincere and significant analytical attitude.

5. Triangulation and Discussion

5.1 Convergence across Both Datasets

The most significant outcome of triangulating faculty and student data is the degree to which independent instruments yield convergent findings. Faculty observe that students engage more deeply with application-based sessions; students report that real-world examples are their most powerful engagement trigger. Faculty note a longitudinal shift toward outcome-focus and rapid comprehension; students demonstrate this in their assignment and evaluation preferences. Both datasets independently confirm that the analytical, applied dimension of learning is where contemporary educational energy is concentrated.

This convergence matters because it rules out the most common objection to student-reported data: that students simply express preference for what requires less effort. If lower-effort learning were the true driver, students would report equal or stronger preference for theory exams over case studies and projects. They do not. The consistent preference for applied and analytical tasks — which are typically more cognitively demanding — suggests that students are not seeking comfort but seeking relevance and intellectual traction.

5.2 The Perception-Reality Gap

The most diagnostically significant finding of this study emerges from the juxtaposition of two data points: faculty rate student real-world preparedness at 2.56 out of 5, yet 81% of students demonstrate logic-based or experimentally oriented problem-solving, and 69% engage analytically with information even when easy answers are available. These two pictures appear to describe different students — and yet they describe the same population.

The resolution to this apparent contradiction lies in the structure of current educational assessment. If evaluation formats predominantly test conceptual recall — through written examinations, theory questions, and rote reproduction — then the analytical competencies students possess remain largely invisible to faculty. A student who thinks analytically but is evaluated conceptually will appear underprepared, not because they lack capability, but because the assessment architecture does not surface it. This insight reframes the problem: it is not that students need to develop analytical skills, but that institutions need to design systems that reveal and reward the analytical orientation that students already hold.

The data reveals a structural misalignment: students are analytically capable, but assessments are conceptually designed. The preparedness gap faculty perceive may be, in significant part, a visibility gap — the result of testing instruments that measure the wrong competencies.

5.3 AI Availability and Analytical Behaviour

A recurrent concern in public discourse about AI in education is that easy information access will produce intellectually passive students who outsource thinking to machines. This study provides preliminary empirical grounds for questioning that narrative. The finding that 69% of students read to understand after receiving quick answers — and only 5% move on without engaging — suggests that the cognitive instinct to comprehend is not extinguished by convenience but may, in some students, be sharpened by it.

This does not mean that passive AI use is absent. The 14% who memorise answers and the 5% who disengage represent genuine educational risks. But they are a minority. And the faculty observation that students now ask more how and why questions (score 3.40) alongside seeking faster understanding (3.88) suggests a population managing a productive tension: using AI to accelerate access while developing analytical instincts to make sense of what is accessed.

The pedagogical implication is constructive rather than defensive. Rather than designing curricula in opposition to AI, educators can design tasks that harness this tension — that require students to engage with AI-generated content analytically, to interrogate its reasoning, extend its arguments, and test its conclusions against real-world evidence. This approach converts potential AI passivity into active analytical engagement.

5.4 Student Confidence and the Articulation Gap

Faculty ratings of student confidence across four domains reveal a pattern that deserves specific attention. Students are perceived as most confident in navigating multiple information sources (3.88) and least confident in explaining concepts (3.20). Confidence in applying concepts sits at 3.48. This confidence hierarchy mirrors the usage pattern of an AI-native generation: strong at finding and curating information, weaker at articulating the conceptual structures that underpin it.

This articulation gap is an important diagnostic finding. Students can solve problems using logic (54%), relate situations to real-world contexts (13%), and experiment with different approaches (14%) — yet they struggle to verbalise the conceptual frameworks that explain what they are doing. This suggests a specific developmental need: not more content delivery, but structured opportunities to articulate analytical reasoning — through oral defences, reflective writing, debate, and discussion formats that externalise internal cognitive processes.

6. IMPLICATIONS FOR EDUCATIONAL PRACTICE

The findings of this study generate a set of evidence-grounded recommendations for educators and institutions navigating the AI era. These are direct extrapolations from patterns seen across two separate survey instruments rather than conjectural recommendations.

1. Rethink the architecture of assessments in light of applied demonstration. The research suggests that assessment is the main tool for change, with 94% of students favoring practical, case-based, or combination evaluation over theory exams and faculty evaluating real-world preparation at 2.56/5. Project-based evaluations, case analyses, oral defenses, and real-world problem-solving exercises should be used in addition to or instead of written theory tests.
2. Take the lead in pedagogical design that is applicable to the real world. When instructors employ real-world examples, student involvement reaches its pinnacle at 4.64, which is the highest score in the entire student dataset. Instead of teaching theory before application, curriculum design could start with applied problems and develop conceptual frameworks contextually.
3. Provide opportunities for analytical articulation that are organized. According to the confidence statistics, pupils are capable of critical thought but find it difficult to express it. Analytical skills that are hidden by present assessment methods will emerge and be strengthened when students are required to clarify their reasoning processes through written reflections, Socratic debates, or

annotated submissions.

4. Use AI as a teaching tool rather than a resource that is forbidden. The finding that 81% of students engage analytically with AI-generated content — reading to understand or applying to similar problems — suggests that AI can function as a thinking partner when tasks require evaluative engagement with its outputs. Faculty can design assignments that ask students to critique, extend, or challenge AI-generated analyses.
5. Bridge the perception-reality gap through faculty development. Faculty are currently unable to see the analytical competencies students possess because assessment tools do not reveal them. Professional development programmes that equip educators with analytical assessment design skills will help close this gap and recalibrate expectations of student capability.

7. LIMITATIONS AND FUTURE RESEARCH

This study carries several limitations that future work should address. The sample is skewed toward post-graduate students and geographically focused within Indian management education, which limits the findings' applicability to other academic and cultural contexts. Although enough for identifying patterns, the faculty sample of 25 does not allow for inferential statistical analysis. Because self-report questionnaires are based on high-performing cohorts from previous years, students may overreport their analytical engagement, and instructors may underestimate students' preparation.

Longitudinal designs that monitor student learning results and career trajectories across cohorts taught using analytical versus traditional pedagogical techniques should be the focus of future research. Causal inference about the effect of applied assessment on quantifiable competency growth would be possible through experimental research comparing assessment designs within the same cohort. Whether the patterns found here are unique to Indian management education or represent a more general generational shift in learning orientation would be determined by cross-disciplinary and cross-national replications.

8. CONCLUSION

In an era where artificial intelligence (AI) can carry out the knowledge retrieval and concept explanation tasks that have traditionally filled a large portion of formal education, this study set out to determine whether analytical and application-based learning remains educationally viable—and worthwhile. The response is compelling and affirmative, based on empirical data from two separate survey tools.

Teachers and students agree on one fundamental fact: education that links knowledge to real-world contexts, requires reasoning rather than memorization, and prioritizes demonstration over replication is best suited to the learning styles of this generation of students and the demands of the workplace. Analytical learning is still relevant despite the AI revolution. It is now vital.

This study's perception-reality gap, which shows that students have a strong analytical orientation but teachers perceive graduates as unprepared, is a structural issue rather than a human one. It is not pupils who lack the necessary skills, but rather assessment systems that measure the incorrect things. Students' identities do not need to change in order to close that gap. It necessitates a shift in the way institutions see, cultivate, and assess them. Institutions that rise to this challenge — that redesign curricula around analytical engagement, align assessment with applied demonstration, and position AI as a pedagogical resource rather than an adversary — will be the ones best placed to produce graduates who are not merely knowledgeable, but genuinely capable of navigating a world that AI is rapidly reshaping.

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