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Measured-Readiness Framework

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Abstract

India produces over 1.5 million engineering graduates each year, yet placement outcomes diverge sharply by institutional tier: graduates of the Indian Institutes of Technology (IITs) and comparable Tier-1 institutions achieve placement rates of 80–90% at premium compensation, while Tier-2 and Tier-3 institutions — which educate the overwhelming majority of India's engineers — see placement rates of 50–75% and below, at a fraction of the compensation. The dominant explanation, implicit in hiring practice and explicit in social discourse, is a *capability gap*: Tier-1 students are presumed to be intrinsically more able. This paper argues that the evidence does not support this explanation. Admission to elite institutions is determined substantially by access to entrance-examination coaching, information networks, and family resources — inputs that select for socioeconomic advantage as much as for ability. Natural experiments such as Super 30, the documented success of Tier-3 graduates in skills-based hiring at global product companies, and the absence of tier-based pay differentiation once candidates clear skills-based screens all indicate that the gap is produced by differential access to
resources, structured rigour, and guidance — not by differences in underlying cognitive capability. We formalise this as the **Parity Hypothesis** and decompose the elite-institution advantage into seven replicable mechanisms: curated curriculum currency, enforced deliberate practice, objective continuous assessment, peer effects, guidance and information capital, recruiter access, and credible signalling. We then present a bridge framework — the Readiness Method — that operationalises all seven mechanisms inside an ordinary Tier-2/Tier-3 college using curriculum-to-competency mapping, a four-pillar semester-by-semester readiness roadmap (technical, aptitude, communication, interview), seasonally refreshed frontier-skill tracks, auto-graded real-environment assessment (OSIP), integrity-verified credentials (ProctorShield), and an evidence-linked Skill Passport that substitutes measured proof for institutional brand. Finally, we propose a multi-cohort quasi-experimental study design to test the hypothesis, with pre-registered hypotheses, instruments, and outcome measures benchmarked against both IIT placement outcomes and the graduate-outcome standards of leading international universities. We project, on the basis of pilot modelling, that a structured 4-semester intervention can raise the share of placement-ready students in a typical Tier-2/3 cohort from under 30% to above 80% — statistical parity with Tier-1 outcomes.

Keywords: employability, engineering education, Tier-2 and Tier-3 institutions, IIT, skills-based hiring, placement readiness, educational equity, India, objective skill assessment, NEP 2020

1. Introduction: The Parity Hypothesis

Every placement season, the same sorting repeats. Recruiters arrive first — and pay most — at a small set of elite campuses. The graduates of roughly 23 IITs, a handful of top NITs and IIITs, and a few private institutions absorb a disproportionate share of premium offers, while students at the thousands of Tier-2

and Tier-3 colleges affiliated to state universities such as VTU, JNTU, and RGPV compete for a thinner, lower-paid slice of the market. The sorting is so consistent that it is rarely questioned: the institution a student attends at age 18 is treated as a lifetime proxy for capability.

This paper challenges that proxy. Our central claim — the **Parity Hypothesis** — is the following:

> ***Given equivalent resources, structured rigour, objective measurement, and guidance, the median student of a Tier-2 or Tier-3 engineering college can reach the same placement-relevant competency level as the median graduate of an IIT or a leading international university, within the span of an undergraduate programme.***

The hypothesis is deliberately falsifiable. It does not claim that selection effects are irrelevant, nor that every student will converge. It claims that the dominant share of the observed outcome gap is attributable to *inputs* — coaching, curriculum currency, practice infrastructure, assessment, mentorship, and information — rather than to fixed differences in ability. If that is true, the gap is an engineering problem, not a destiny: it can be closed by systematically delivering the missing inputs inside ordinary institutions.

The argument matters at national scale. India's overall graduate employability stands at just 56.35% in the latest India Skills Report (2026), meaning more than four in ten graduates are not job-ready by employer-aligned assessment — and the burden of that shortfall falls almost entirely on Tier-2 and Tier-3 institutions, which enrol the vast majority of students. At the same time, the fastest-growing roles — AI, data, cloud, cybersecurity — are exactly those where institutional pedigree matters least and demonstrable skill matters most. The window for parity has never been wider.

The remainder of the paper proceeds in four movements. Section 2 establishes the size and shape of the outcome gap. Section 3 marshals the evidence that the gap is produced by resources and guidance rather than ability. Section 4 decomposes the elite-institution advantage into seven mechanisms and shows that each is replicable. Sections 5–7 present the bridge framework, a proposed empirical study to test it, and projected outcomes. Section 8 discusses policy implications under NEP 2020 and outcome-based accreditation.

2. The Outcome Gap: What the Data Shows

2.1 Placement and employability by tier

The headline numbers are stark. Tier-1 institutions (IITs, top NITs) report placement rates of 80–90% with average packages of ₹12–25 LPA; Tier-2 institutions report 50–75% at ₹3–8 LPA; Tier-3 colleges — typically VTU/JNTU/RGPV-affiliated institutions in smaller cities — average ₹2–5 LPA with predominantly services-sector recruitment. Across all engineering education levels, AICTE data for 2019-20 to 2022-23 shows that of 6.01 million enrolled students, only 41.4% were successfully placed.

Indicator	Tier-1 (IIT/NIT)	Tier-2	Tier-3
Typical placement rate	80–90%	50–75%	<50% (often far lower)
Average package	₹12–25 LPA	₹3–8 LPA	₹2–5 LPA
Dominant recruiter type	Product, finance, consulting	Mixed services/product	Mass services hiring

On-campus recruiter density	Very high	Moderate	Low / sporadic

Table 1. Indicative placement outcomes by institutional tier, 2025–26 placement cycles (compiled from published placement analyses and NIRF-linked reports).

2.2 The national employability baseline

The India Skills Report 2026 — based on over 100,000 candidate assessments through the Global Employability Test and responses from 1,000+ employers — puts national employability at 56.35%, up from 46.2% in 2022. Engineering (B.E./B.Tech) graduates fare better at ~70%, with computer science and IT engineers at 80% and 78% respectively, driven by AI, data analytics and automation roles. Encouragingly for our thesis, the same report identifies Tier-2 and Tier-3 cities such as Lucknow, Kochi and Chandigarh as emerging employability hubs — evidence that geography and institutional pedigree are not destiny when skilling access improves.

2.3 What recruiters actually screen on

Across campus drives, recruiter gates are remarkably standardised: an aptitude test (quantitative, logical, verbal, data interpretation), a coding/DSA round, one or more technical interviews increasingly including system design and — since 2023 — GenAI familiarity, a group discussion or communication screen, and an HR round. None of these gates tests institutional pedigree directly. Yet a structural audit of state-university curricula (our analysis of the VTU CSE 2021, 2022 and 2025 schemes) shows zero dedicated aptitude credits across all three revisions, communication instruction confined to first-year English, no structured interview or GD preparation, and frontier technology (agentic AI, MLOps, edge AI) arriving only as seventh-semester electives — roughly three years after these skills became hiring priorities. The curriculum builds knowledge; the gates test readiness. The space between the two is the gap this paper addresses.

3. The Case That It Is Not the Brain

If the outcome gap reflected innate capability, we would expect four things to be true: admission to elite institutions would be independent of family resources; students denied resources would fail even with later support; employers would observe persistent performance differences after controlling for demonstrated skill; and compensation would track pedigree rather than skill. All four predictions fail.

3.1 Elite admission selects for coaching access, not raw ability alone

The JEE is formally meritocratic, but preparation for it is a purchased input. Multi-year coaching programmes cost several lakhs of rupees; analyses of JEE outcomes consistently find that success concentrates among students from CBSE/ICSE schools and coaching hubs, while candidates from low-income state-board backgrounds are systematically underrepresented — not because they reason less well, but because the exam rewards a specific, expensive, intensively drilled preparation that their schools do not provide. Socioeconomic analyses of JEE and NEET reach the same conclusion: the cost of coaching "holds back a bafflingly large number of students who otherwise might have succeeded." What the JEE measures, in substantial part, is access.

3.2 The Super 30 natural experiment

The clearest existence proof comes from Super 30 in Patna. Beginning in 2002, the programme selected 30 students per year from economically impoverished backgrounds — students who by definition could not afford coaching — and supplied exactly the inputs this paper identifies: structured rigour, expert guidance, study materials, and a focused peer cohort. In its very first year, 18 of 30 cleared the IIT-JEE;

in many subsequent years, the pass rate approached 100%. Nothing about the students' brains changed. Their resources and guidance did. The same population that the system classifies as "not IIT material" becomes IIT material the moment the inputs are equalised.

3.3 Skills-based hiring already pays for skill, not pedigree

Global product companies hiring through skills-based channels do not differentiate compensation by tier: Tier-3 graduates who clear the same technical screens at companies such as Amazon, Google, Microsoft and Adobe receive packages in the ₹39–45+ LPA range — indistinguishable from their Tier-1 counterparts. The list of Tier-3 students placed at top product companies is long and growing, and online learning has placed identical instructional material within reach of any student with a smartphone. Where the screen is objective, the pedigree premium disappears. This is precisely what the Parity Hypothesis predicts — and it localises the problem: most Tier-2/3 students never reach those screens prepared, because nothing in their environment prepares them.

3.4 Convergent evidence

- **Within-tier overlap.** Published tier analyses note that Tier-2's top performers routinely outperform Tier-1's bottom performers, and that a Tier-3 student with strong CGPA, internships and a project portfolio out-competes a credentialed but unpractised Tier-1 peer — impossible if tier proxied fixed ability.
- **Infrastructure causality runs through institutions, not students.** Expert commentary on declining engineering placements attributes Tier-2/3 underperformance to outdated curricula, faculty shortages, and missing labs, industry partnerships and internships — institutional inputs. Regulatory action confirms it: AICTE has ordered intake cuts at state-run colleges citing lack of basic infrastructure, faculty and laboratories.
- **Employability is moving where access moves.** The decade-long rise in national employability (46.2% → 56.35%) has been driven disproportionately by digital skilling access in Tier-2/3 cities and by inclusive learning channels — a dose-response relationship between input access and outcomes.
- **The gates are trainable.** Every recruiter gate — aptitude, DSA, communication, interviews — is a practised skill with well-documented training curves. None is a fixed trait.

We do not claim selection contributes nothing; entrance examinations do concentrate certain test-taking strengths. We claim the *remediable share* of the gap — the share produced by missing inputs — is large enough that closing it produces statistical parity in placement outcomes. Section 6 proposes the study that would measure exactly that share.

4. Decomposing the Elite-Institution Advantage

If pedigree is not capability, what exactly do IITs — and leading international universities such as MIT, Stanford, Cambridge or NUS — actually deliver that ordinary colleges do not? We identify seven mechanisms. The decomposition matters because each mechanism, examined individually, turns out to be replicable; only one (brand signalling) is structurally exclusive, and even it has a functional substitute.

#	Mechanism	How the elite institution delivers it	Replicable in Tier-2/3?
M1	Curriculum currency	Faculty close to research and industry refresh content	Yes — via curriculum-to-competency mapping plus a

		continuously; electives track the frontier	seasonally refreshed hot-skills layer
M2	Enforced deliberate practice	Problem-set culture, graded labs, competitive peer norms force thousands of repetitions	Yes — auto-graded daily tasks in real lab environments replicate the repetition engine
M3	Objective continuous assessment	Frequent rigorous evaluation; students always know where they stand	Yes — composite readiness scoring on hidden-test, real-environment tasks (OSIP)
M4	Peer effects	Dense concentration of motivated peers normalises high effort	Partially — cohort-based tracks, leaderboards, visible readiness bands recreate the norm-setting function
M5	Guidance & information capital	Alumni networks, informed seniors and faculty transmit what to learn, when, and for whom	Yes — role-targeted semester roadmaps encode the guidance explicitly, removing dependence on inherited networks
M6	Recruiter access	Employers come to campus because screening cost per quality hire is low	Yes, conditionally — verified cohort-level readiness data lowers screening cost and attracts recruiters to any campus
M7	Brand signalling	The institution's name certifies a selection event that happened at age 18	Substitutable — evidence-linked, integrity-verified skill credentials certify present competence instead of past selection

Table 2. The seven mechanisms of the elite-institution advantage and their replicability.

Two observations follow. First, M1–M5 are pedagogical and informational — they are services, not endowments, and services can be delivered anywhere. Second, M6 and M7 are economic signalling problems: recruiters use brand because verifying individual skill has historically been expensive. The moment a college can hand a recruiter *trustworthy, auto-graded, integrity-verified evidence of each student's competence*, the economic rationale for brand-first screening weakens. The bridge framework in Section 5 is engineered around exactly this insight: replicate M1–M5 pedagogically, and substitute measured evidence for M6–M7.

4.1 The global benchmark

Leading international universities add two further ingredients worth naming: portfolio-and-project pedag-

ogy (students graduate with demonstrable artefacts, not only grades) and career-services infrastructure that treats employability as an institutional deliverable. Both are input-side practices — and both are explicitly incorporated into the framework below (capstone projects with real datasets; a placement program treated as a core, graded track). Parity with these institutions is therefore the same engineering problem with a higher target on the same axes, not a different problem.

5. The Bridge: A Measured-Readiness Framework

We now present the framework — the Readiness Method, operationalised in the c2cedge platform — that delivers the seven mechanisms inside an ordinary institution. Its design principle is captured in one sentence: ***know who's ready, not who finished.*** Attendance and completion are replaced as units of account by measured, evidence-linked readiness.

5.1 Step 1–2 · Curriculum-to-competency mapping (delivers M1, M5)

The institution's existing curriculum — every course, every semester — is uploaded and auto-mapped against the competency profile of the target role and of placement gates generally. The output is a coverage map: what the curriculum already builds (typically the CS technical core — DSA, OS, DBMS, CN — is well covered), what it covers partially (communication, cloud and tooling), and what it misses entirely (aptitude, structured interview preparation, current frontier skills). Crucially, this respects the institution's academic identity: the framework augments the curriculum rather than replacing it.

5.2 Step 3 · The four-pillar readiness model (delivers M3)

Readiness is decomposed into the four pillars recruiters actually test, each continuously measured:

- **Technical mastery** — DSA, the role stack, core CS, and real projects, assessed by hidden-test auto-grading in live lab environments.
- **Aptitude** — quantitative, logical, verbal and data-interpretation reasoning, delivered as a dedicated graded track from the fourth semester (filling the zero-credit hole in state curricula).
- **Communication** — spoken fluency, group discussion and presentation, assessed live and continuously rather than confined to first-year English.
- **Interview readiness** — resume quality, mock technical and HR rounds, rubric-scored and repeated until performant.

The pillars combine into a single composite Placement Readiness Score per student — one objective number that tells the student, the training and placement officer (TPO), and ultimately the recruiter exactly where the student stands.

5.3 Step 4 · The semester roadmap (delivers M2, M4, M5)

The gap-filling work is laid out as a semester-by-semester plan with explicit readiness gates — in a typical four-semester deployment: foundations (Sem 4, gate 50/100), consolidation (Sem 5, gate 63), specialisation (Sem 6, gate 75) and placement (Sem 7, gate 88). Daily auto-graded tasks supply the deliberate-practice engine; cohort-visible progress supplies the peer-norm function; the roadmap itself encodes the guidance that elite students inherit from their networks.

5.4 Hot skills, refreshed every season (delivers M1)

Industry rewrites roughly 8% of core skills per year — the WEF Future of Jobs 2025 projects 39% of core skills changing by 2030 — while curriculum revision cycles run on multi-year timescales. The framework therefore carries a seasonally refreshed frontier-skills layer woven through every semester: foundational early (Git, Python for AI, cloud fundamentals, prompt engineering), applied mid-programme (GenAI application development, RAG, vector databases, containers), and frontier near placement (agentic AI,

LLMOps, edge AI, responsible AI). This collapses the ~3-year lag between a technology going mainstream and a student reaching it.

5.5 Measurement and trust infrastructure (delivers M3, M6, M7)

Three components convert pedagogy into a recruiter-grade signal:

- **Campus Readiness Audit (OSIP).** Each skill is scored on real, auto-graded tasks — hidden tests, lab assertions, cloud tasks — producing an objective baseline and longitudinal measurement, not self-report.
- **ProctorShield.** Assessment integrity is enforced end-to-end, so every score and certificate the institution issues can be trusted by third parties.
- **Skill Passport.** Every student carries portable, evidence-linked, recruiter-verifiable proof of exactly what they can do. This is the functional substitute for brand signalling (M7): where the IIT name certifies a selection event at 18, the passport certifies demonstrated competence now.

5.6 Early intervention (the TPO loop)

Because measurement is continuous, at-risk students are flagged semesters before the placement gate — by weakest pillar, with targeted intervention tracks and projected score lifts — converting the TPO's role from end-stage triage to early-stage course correction. This is the operational difference between knowing in Semester 7 that 44% of the cohort is unready and knowing in Semester 4 which 44%, on which pillar, and what to do about it.

6. Proposed Empirical Study

6.1 Hypotheses

1. **H1 (Baseline equivalence).** On domain-general reasoning measures administered without preparation advantage, Tier-2/3 cohorts will not differ from Tier-1 cohorts by more than a small effect size ($d < 0.3$) — i.e., the raw-ability gap is small relative to the outcome gap.
2. **H2 (Intervention effect).** Cohorts receiving the full four-pillar intervention will increase their placement-ready share (composite score ≥ 70) from a baseline near 30% to above 80% by the placement semester.
3. **H3 (Parity).** Post-intervention, treated cohorts will show no statistically significant difference from IIT-comparable benchmarks on recruiter-gate performance measures (aptitude percentile, DSA pass rate, interview rubric scores).
4. **H4 (Signal substitution).** Recruiters presented with evidence-linked Skill Passports will show measurably reduced tier-based screening discrimination (audit-study design with matched candidate profiles).

6.2 Design

A multi-site, quasi-experimental, matched-cohort design across 6–10 VTU-affiliated (or equivalent state-university) engineering colleges, with treated cohorts ($n \approx 120$ per site) receiving the full framework from Semester 4 and matched comparison cohorts (same institution tier, programme and region) continuing standard practice. Randomisation at the section or cohort level where institutionally feasible; difference-in-differences estimation otherwise. Baseline equivalence (H1) is tested via a proctored reasoning battery administered identically across treated, comparison, and (subject to access) Tier-1 reference samples.

6.3 Instruments and outcome measures

- **Primary:** composite Placement Readiness Score trajectory (OSIP-measured, ProctorShield-verified); share of cohort ≥ 70 at the placement semester; actual placement rate, offer quality and compensation

at 6 and 12 months post-graduation.

- **Secondary:** pillar-level scores; time-to-first-offer; recruiter Net Promoter Score for the campus; CO–PO attainment evidence quality for NBA/NAAC purposes.
- **Mechanism checks:** dose-response between completed graded tasks and score gains; mediation of outcomes by pillar gains; audit-study callbacks for passport-carrying vs. pedigree-only profiles (H4).

6.4 Pilot modelling

Modelling calibrated on prior enterprise-skilling deployments of the same method projects the following trajectory for a standard-intensity deployment, with light and intensive variants bracketing it:

Scenario	Sem 4 (baseline)	Sem 5	Sem 6	Sem 7 (gate)
Light plan	29%	33%	46%	68%
Standard plan	29%	35%	58%	**84%**
Intensive plan	29%	38%	67%	91%

Table 3. Projected placement-ready share of cohort (composite score ≥ 70) by semester and plan intensity. Projections are replaced by measured values after each audit cycle.

A Semester-7 ready-share of 84–91% places the treated cohort inside the 80–90% placement band reported by Tier-1 institutions — the operational definition of parity used in this paper. Against international benchmarks, the same measured-evidence infrastructure supports the second pathway named in our title: a student with a verifiable Skill Passport, a project portfolio and measured English communication scores is materially better positioned for admission to, and success at, leading foreign universities, where holistic and evidence-based evaluation already dominates.

6.5 Limitations

Three limitations deserve candour. First, projections in Table 3 are planning models until validated by measured audits; the study exists to replace them with data. Second, parity in readiness does not mechanically produce parity in offers while recruiter behaviour lags — H4 tests how quickly evidence substitutes for brand, and recruiter-side adoption is a genuine dependency. Third, selection into elite institutions does concentrate some traits (notably examination temperament and early mathematical fluency); our claim concerns the remediable share of the gap, and the H1 battery is designed to bound, not assume away, the residual.

7. Implications for Institutions and Policy

- **For colleges:** the framework converts placement readiness from an aspiration into an auditable, accreditation-aligned process — every graded task maps to CO–PO attainment, generating the outcome-based-education evidence NBA and NAAC increasingly demand, while a credible placement promise differentiates the institution in a contracting enrolment market.
- **For policy:** NEP 2020's skills-integration agenda and AICTE's mandatory-internship and emerging-technology initiatives point in this direction; what is missing nationally is the measurement layer — objective, integrity-verified, portable skill evidence. A national readiness-score infrastructure would

do for employability what standardised testing did for admissions, but on present competence rather than one-day examination performance.

- **For recruiters:** campus screening cost, not candidate quality, is the binding reason recruiter attention concentrates on elite campuses. Verified cohort-level readiness data inverts the economics: any campus that can prove its distribution becomes worth a visit.
- **For students:** the deepest implication is psychological. A student told for four years that their college determines their ceiling behaves accordingly. A student shown a measured score, a visible trajectory and a closing gap behaves differently. The framework's most important output may be the replacement of inherited pessimism with evidence.

8. Conclusion

The sorting of Indian engineering graduates by institutional tier is real, large and consequential — but the best available evidence says it is manufactured by unequal inputs, not by unequal minds. Coaching access shapes who enters the IITs; Super 30 shows what the excluded achieve when inputs are equalised; skills-based hiring shows the pedigree premium evaporating wherever screens are objective; and the mechanisms of the elite advantage, examined one by one, prove to be services and signals — both deliverable elsewhere. The Parity Hypothesis is therefore not a slogan; it is a falsifiable claim attached to a deployable method and a proposed study. If the projections hold — and the study is designed to find out — a Tier-3 student in a small-city college, given the same structured rigour, current skills, honest measurement and guidance as an IIT student, finishes the degree equally ready. It was never the brain. It was the resources, and the guidance — and both can now be engineered.

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