Curriculum gaps and Transition Barriers: Evidence for Equitable Workforce Policy in the AI era

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What do we mean by “equity” in the AI era?

- Ensuring that all graduates, regardless of institution or background, have equal opportunity to participate in AI-augmented work.
- Curriculum design must reflect inclusion in emerging AI driven sectors, not just employability in traditional ones.
- Policy and institutional alignment should promote fair pathways for upskilling and reskilling across all universities.
- The goal : equal readiness, not identical curricula

Why this matters: The policy context

The changing landscape:

- Artificial intelligence is transforming labour markets faster than education systems can adapt.
- Most national frameworks lack clear metrics for AI-readiness or skill alignment.
- Emerging evidence shows widening digital and data literacy divides across institutions.

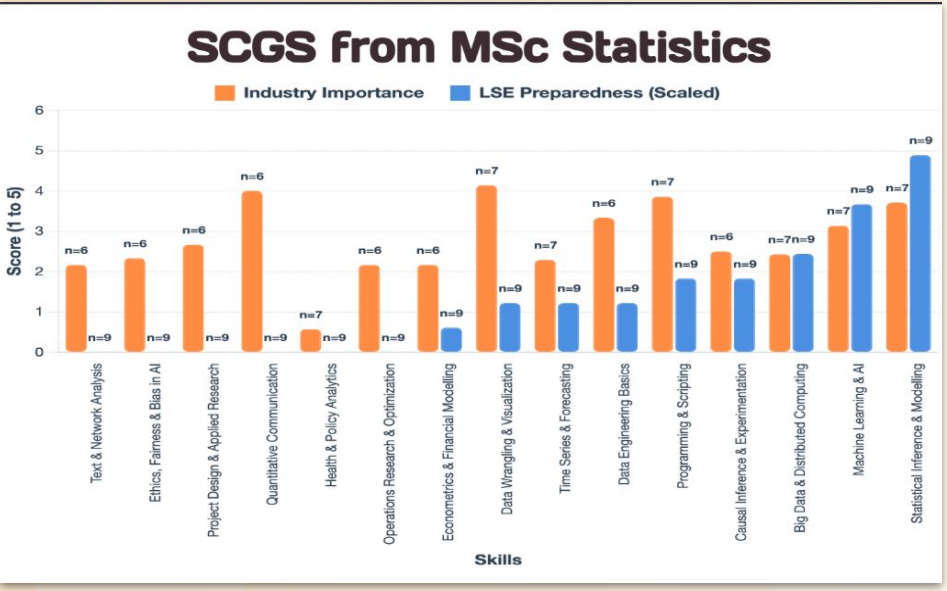
LSE Change Makers Pilot study

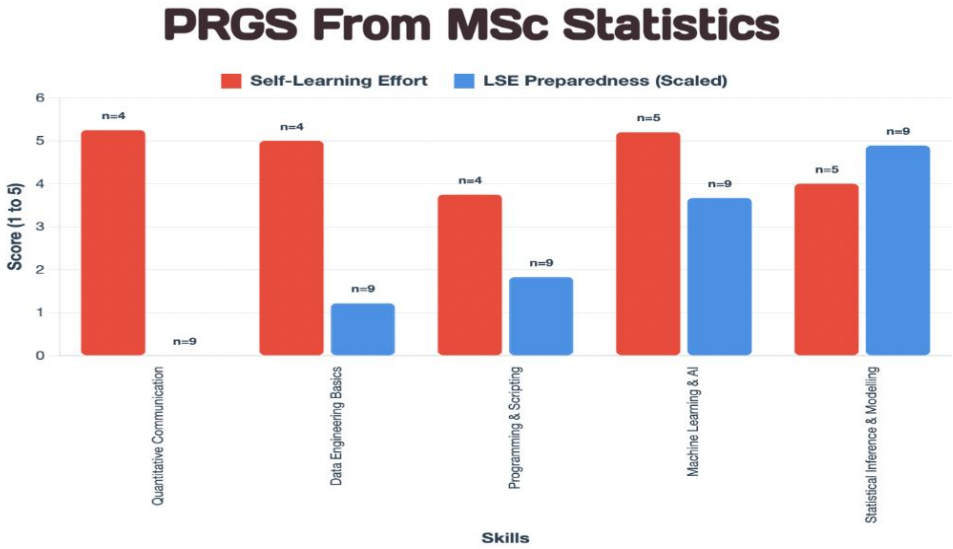
- This study was conducted as part of the LSE Change Makers research initiative (2024-2025).
- Our aim was to understand how experiential learning prepares students for AI-augmented work environments.
- This study focused on alumni of the Department of Statistics at LSE.

Approach:

- Combined a curriculum–industry skill mapping with a student perception survey.
- Developed two indicative measures:
  - Skill Coverage Gap Score (SCGS)
  - Perceived Readiness Gap Score (PRGS)

Key takeaways from Change Makers





Expansion – The research questions

If even elite institutions show measurable skill gaps, how can national policy ensure equitable AI transitions for all?

Our research questions:

- RQ1: Which curriculum-to-occupation skill gaps create the greatest barriers to entering high demand AI augmented roles?
- RQ2: What skill overlap patterns enable feasible transitions from declining high AI exposure occupations into growing roles?

The Methodology

1. Data Integration *(All Public Sources)*

- O*NET 30.0: 35 standardized skills, 668 occupations
  (e.g., Critical Thinking, Programming, Coordination, Service Orientation)
- Felten AIOE Index: AI automation exposure by occupation
  Range: –2.67 → +1.58 (High = more exposed)
- BLS Employment Projections (2024–2034):
  1,113 occupations · Growth range: –36 % → +50 %

2. Analytical Method

- Jaccard Similarity Coefficient:

$$J(A,B) = \frac{|S_A \cap S_B|}{|S_A \cup S_B|}$$

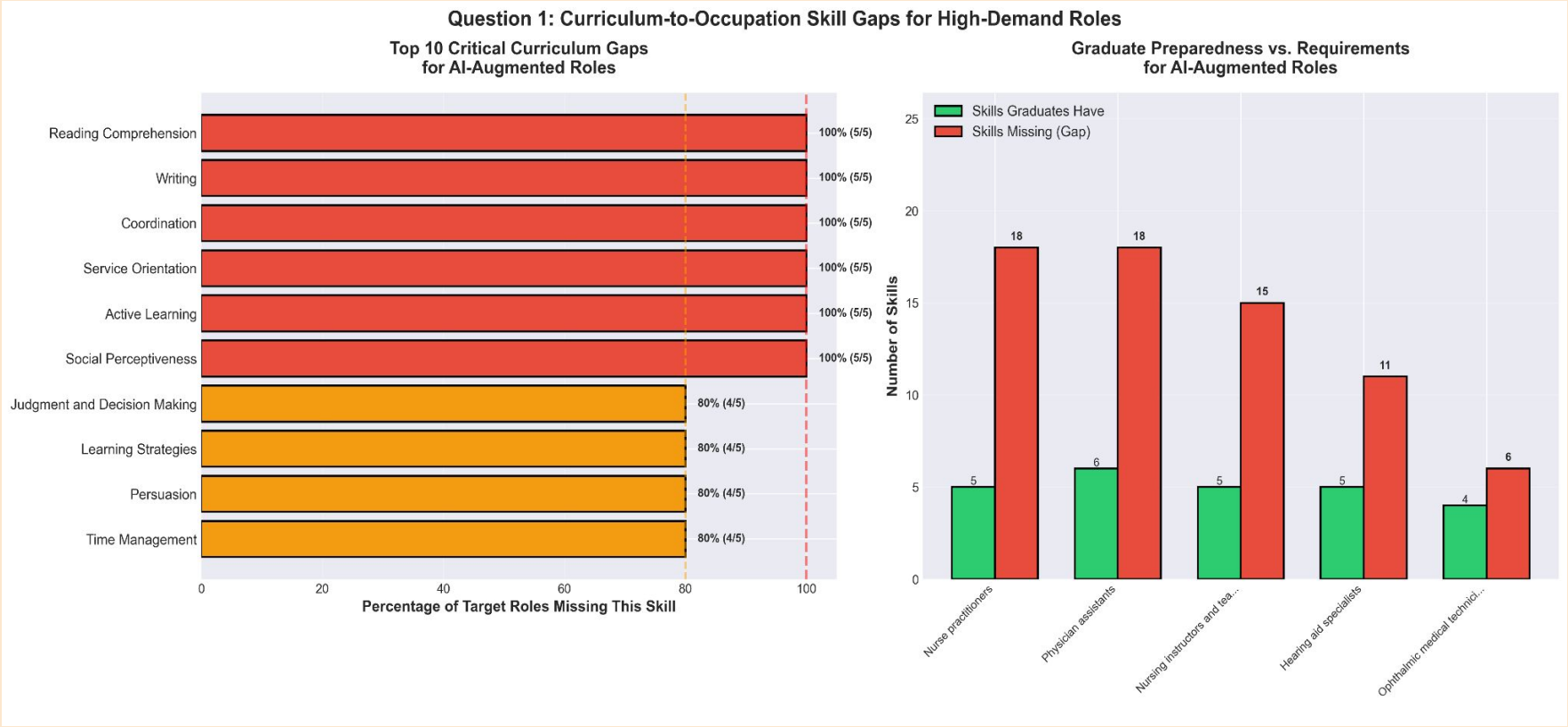
  If Job A & Job B share 6 of 10 skills → J = 0.60
- Built a binary skill matrix (668 × 35):
  1 = required · 0 = not required
- Published, standard method in labour-market research

3. Scope

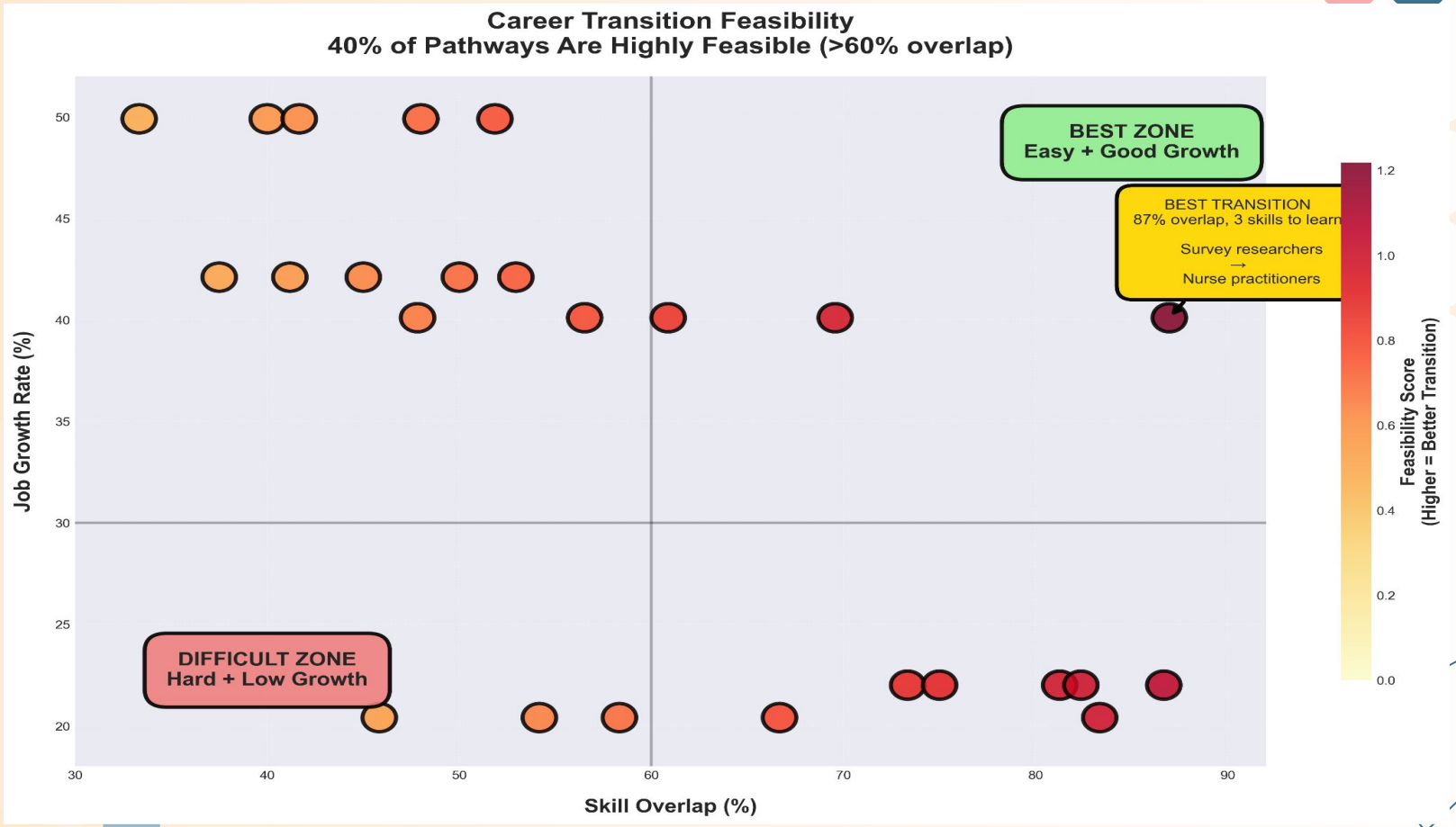
Q1: 5 AI-augmented target roles

Q2: 25 career transitions (5 origins × 5 destinations)

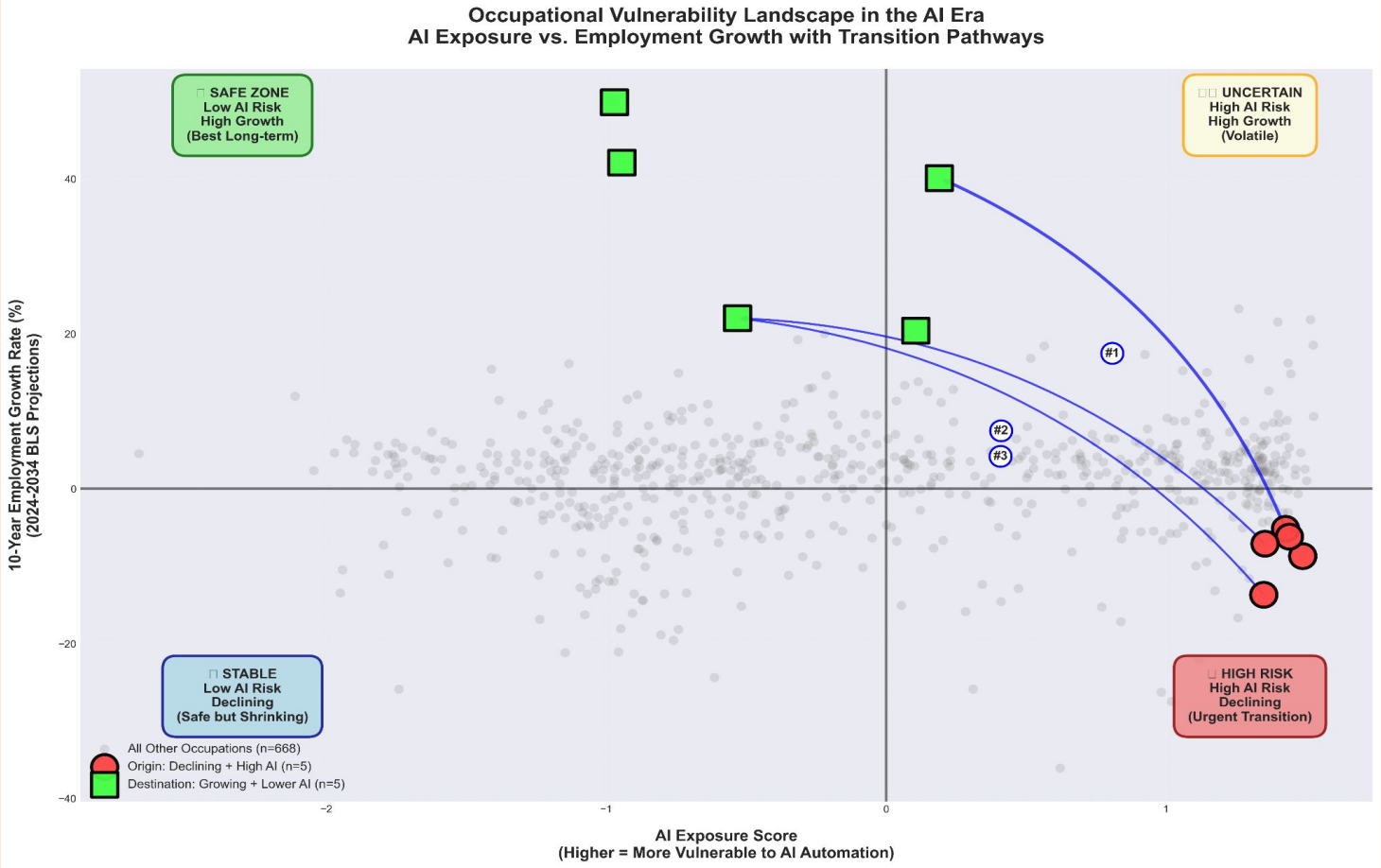
RQ1 : Findings



RQ2: Findings



Full Occupational Landscape



Policy Recommendations

1. Curriculum Modernization ***(from RQ1)***

Action: Integrate 6 critical skills into *all* university programs
→ Reading Comprehension · Writing · Coordination
→ Service Orientation · Active Learning · Social Perceptiveness
Goal: Ensure *equitable skill access* across institutions
Impact: Closes 13.6-skill average gap for AI-augmented roles

2. Targeted Reskilling Programs ***(from RQ2)***

Action: Create 6–12 month certificates teaching transition-critical skills
→ Operations Monitoring · Instructing · Systems Analysis
→ Systems Evaluation · Persuasion
Goal: Enable 10 high-feasibility career pathways
Impact: Median 7-skill gap is achievable through focused training

3. Data-Driven Quality Assurance

Action: Set quantitative skill benchmarks & track graduate outcomes
→ Identify under-resourced programs
→ Measure progress in AI-readiness
Goal: Continuous improvement & accountability across systems

Validation & Limitations

What This Proof-of-Concept Demonstrates

→ Public datasets can be systematically integrated (replicable)

→ Skill gaps can be precisely quantified (specific, actionable)

→ Transition feasibility can be objectively measured (quantitative)

→ Evidence-based workforce policy is achievable (validated approach; Jaccard)

Key Limitations

→ RQ1 Proxy: Used *entry-level occupations* as a stand-in for graduate capabilities → *Course-Skill Atlas* needed for direct curriculum mapping *(Phase 2 priority)*

→ Sample Size: Proof-of-concept scale → *Q1: 5 roles, Q2: 25 pathways → Scalable to 200+* with resources

→ Geographic Scope: Based on *U.S. datasets*; International replication required

→ Skill ≠ Full Feasibility: High overlap doesn't capture *licensing, credentials,* or *practical barriers*

Conceptual framework

Department-Level Skill Mapping

- Collect *course-specific skill data* from each university department
- Identify *actual skills students gain* across diverse programs

Curriculum-to-Occupation Alignment

- Compare extracted course skills with *national occupation datasets*
- Measure *real curriculum–industry gaps* across institutions

National Integration

- Link skills to *domestic labour market data* (jobs, sectors, growth rates)
- Apply Jaccard similarity for precise *skill-overlap and transition analysis*

Policy Application

- Use results to design *curricula and reskilling pathways* that:
  → Equip graduates with *future-proof skills*
  → Minimize *automation risk*
  → Promote *equitable workforce readiness*

Next steps & Scaling

Phase 1 — Completed

- Methodology validated across 3 integrated datasets
- 668 occupations analyzed
- 6 curriculum gaps identified *(Q1)*
- 10 transition pathways quantified *(Q2)*
- Proof-of-concept: *public data enables precise, evidence-based analysis*

Phase 2 — Planned (6–12 months)

➡ Integrate Course-Skill Atlas

- Analyze *actual university curricula* (not proxies)
- Compare *elite vs. non-elite* institutions → answer Q1 fully

➡ Scale Occupation Analysis

- Expand to 200+ occupation pairs
- Cover *multiple sectors* (tech, business, healthcare, education)
- Add *international comparisons* (UK, EU, Asia)

Phase 3 — Implementation (12–24 months)

➡ Tool Development

- *Transition Pathway Explorer* for career counselors
- *Curriculum Gap Dashboard* for institutions

➡ Validation & Piloting

- *Employer and educator interviews*
- *Pilot reskilling program* with outcome tracking
- *Policy briefs* for government agencies

Conclusion

Substantial Skill Gaps Exist

01

- 13.6-skill average gap for AI-augmented roles
- Only 29 % graduate preparedness
- 6 critical skills systematically missing from curricula

Feasible Transition Pathways Exist

02

- 40 % of analyzed transitions are *highly feasible* (> 60 % overlap)
- 7-skill median reskilling requirement
- Specific, *quantified career pathways* identified

Evidence-Based Policy Is Achievable

03

- Public datasets enable *precise, replicable* analysis
- Jaccard similarity quantifies *transition*

Thank you!