

Redefining Talent in the Digital Age: Addressing the Paper Ceiling in Information Technology Hiring

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Abstract: In this article we investigate hiring in the Indian IT industry and compare degree based and skills-based hiring. It looks at how credentialism affects the job prospects of non-traditionally educated workers (like online certified or bootcamp grads). Applying a mixed-methods methodology—questionnaires and interviews—the research examines perceptions of bias, career obstacles, and recruitment inclusivity. The preference of hiring candidates with degrees, and the limited prospects for nondegree holders, is strong, as is the belief that skills-based hiring can be a DEI tool. Several trends of consistent patterns responding to the concerns and benefits are also observed by the correlation analysis. It is recommended that while skills-based hire has potential to promote inclusion and merit in hiring, its application has become uneven and therefore would require stronger policy or organizational support.

Keywords: Career barriers, Career Opportunities, Degree-based, Skills-based hiring,

Introduction

Background of the Study

With this rapidly evolving digital economy of our era, there has been a multi-fold rise in the need for high-skilled IT professionals. Organizations are increasingly relying on technology-based innovation to improve competitive advantage and business effectiveness. Despite the existence of this kind of demand, the traditional model of recruitment is mired in degree-based filtering, shutting out a huge pool of prospective talent without formal education qualifications but with the right skills. This institutionalized exclusion is what has been called the "paper ceiling."

The paper ceiling refers to the unseen barriers that restricts the peoples those not having the degree programs from accessing the better career openings irrespective of their skills, knowledge or high potential performance. With respect to information technology, autodidactic, and unschooled programmers and certification holders from training center, the paper ceiling limits the individual's career and deny the access to sound human capital. As the shortage of the talent work force in the recent years, companies are pushing towards skill based hirings such as certifications, through candidates self-paced learning over the educational qualifications to full fill the demand of the positions available in the information technology industries. Thus, stressing on the paper ceiling than formal degrees.

Technological Disruption and Changing Job Requirements

The Information Technology (IT) field is going through a major change because of the influx of emerging technologies, such as Artificial Intelligence (AI), cloud computing, cybersecurity, DevOps, data analytics, and blockchain. Innovation is changing business models while at the same time changing the skills and technical competencies required from IT professionals in the field. Today's industry roles require knowledge of agile practices, continuous integration/continuous delivery (CI/CD), machine learning, and cloud-native architecture - skills that change faster than traditional university curricula keep up (World Economic Forum, 2020). There are indications that, employers are starting to value demonstrable skills and experience more than conventional educational backgrounds. Many non-traditional candidates who are able to self-teach themselves programming, or learn through non-traditional education like Coursera, Udemy, edX, coding bootcamps, establish better odds for fitting existing job descriptions than degree holders with outdated curricula (Burning Glass Institute, 2022). Moreover, their learning is timely, modular, highly-relevant, and often specialized and is better-orientated for addressing skills shortages. Additionally, working professionals are increasingly using industry-standard recognized certification providers like AWS, Google Cloud, Cisco, and CompTIA as proxies for their competence in the industry (LinkedIn Learning, 2023).

Unfortunately, when non-degree professionals demonstrate relevant skills, they often continue being overlooked for employment opportunities under institutionalized hiring filters, which have in part led the effect of assessing capacity through formal education, instead of capability. Researchers have coined this growing mismatch as a "skills gap paradox" in which employers state that they are unable to find talent on the open job market - leaving a great number of skilled individuals, underutilized (Harvard Business School, 2021). Technological

Industry Gaps and Organizational Challenges

Although there is an increasing amount of support for skills-first hiring processes, many organizations ultimately lean toward degree-based filtering strategies because of past institutional practices and risk aversion. Degrees are still one of the most widely accepted proxies for competency or value, even if they do not always equate to readiness for the actual job (Fuller et al., 2021). An additional factor is the lack of common tools, or legitimate ways to assess candidates without their possession of a degree or other established credentials. As a result, hiring managers are left to rely on the credentials that they are familiar with. While qualifications such as bootcamp certificates or portfolios may differ as a credential, they may carry little or no value based on the hiring manager's previous training and awareness of the credential. Implicit biases also connect formal education as equating professionalism, and intelligence (Harvard Business Review, 2019). Liaison officers may be concerned about how candidates would represent the organization to client stakeholders; if all candidates playing by the same shaking hands rule; for others in talent; promotion policies may limit their practice to just one degree pathway as part of their policies. Additionally, there may be filters established based on degrees as part of legacy systems and job descriptions that effectively screen out candidates who do not have a degree before human intervention occurs (Burning Glass Institute, 2022). Overcoming these barriers requires moving towards an organizational culture shift around the hiring framework and how organizations assess real-world competence, and ensuring that better assessments are available. If these structural impediments remain in place, the paper ceiling - while arguably well intended - remains intact regardless of ongoing awareness of inclusive hiring.

The Indian Context in IT Hiring

India is recognized as a leading provider of IT services globally, producing over 1.5 million engineering graduates annually (AICTE, 2023). Yet, studies show that only a small portion of the graduates are industry-ready, causing many aspirants to pursue upskilling through online platforms, such as Coursera, Udemy, and NPTEL (NASSCOM, 2022). Even though alternative learning options may become more common, traditional hiring practices in leading IT firms still rely on candidate qualifications via traditional degrees, often looking for talent specifically with an education

pedigree from a Tier 1 institution. This establishes a structural bias that also disqualifies capable, self-taught candidates, and candidates from marginalized educational or socio-economic backgrounds.

This emphasis on degree filters continues due to legacy recruitment methods and corporate client expectations. However, companies like Infosys and Wipro are piloting scales-first hiring approaches to move towards skills-based hiring using internal assessments and bridge programs. However, the scale of such practices remains a potential issue across the industry. Moreover, it remains clear that the skill landscape is becoming increasingly diverse in India, as there are greater volumes of candidates, from candidates with certifications in new fields, such as AI, cloud computing, and cybersecurity, to candidates holding a micro-credential. To make the most out of this talent pool, Indian IT firms need to rethink hiring frameworks and decrease reliance on demographics (LinkedIn Learning, 2023; Burning Glass Institute, 2022).

Literature review

- Bone, Ehlinger & Stephany (2023) study shows that around 11 million jobs in the United Kingdom between 2018 to 2024 companies finds that skill-based hiring for artificial intelligence and the green jobs has raised drastically were compared to degree requirements in AI roles declined by 15 percent approximately. The paper concludes that practical skills are now offer higher salary than conventional degrees.
- George, A. S., & Baskar, T. (2024) paper highlights empirical facts of degree rise and fading in returns on the technical degrees. The authors states that approximately 30% graduate are facing the unemployment. As graduates are increasing, the placement offers are diminishing in the job market.
- Ayyar, R., & Rao, S. (2018) analyses that gap between the industry and degree students in Indian IT firms. It shows the students lack job expectancies, skills and knowledge towards the jobs. For those industries rely on add on courses to fill the positions. These mismatches sustain the concept of paper ceilings by considering self-paced learners rather than practical skills.
- Ganuthula, V. R. R., & Balaraman, K. K. (2025) examines how the artificial intelligence and automation has created differentiation skill based and qualification-based hiring. The Indian labor market shows high concentration in low-skill roles with significant wage disparities, and traditional degree barriers hinder mobility into emerging technical domains. The authors argue that breaking the paper ceiling is crucial to addressing polarized employment outcomes in the digital era.
- Heck, J et al., (2024) describes explores the effects of interstate commitments in the United States to eliminate degree requirements on public attention to and access to jobs for the STARs (Skilled Through Alternative Routes). I find such policy changes greatly enhance exposure and employment chances for non-degree workers. The research demonstrates that public policy can influence labour market norms. Findings offer evidence in favor of expanding skills-based hiring to reduce inequities and create economic opportunity.
- Shore, N., et al., (2024). explores “Academic Library Workers in Conversation” is a C&RL News column in which librarians from around the country discuss issues in academic libraries. There’s always been an appreciation of the wisdom of the watercooler, but this series aims to push even further towards the fire by lowering the barriers of traditional publishing in an accessible format. The authors pitched the subject of each installment in the series and were given free reign. In this issue’s discourse, we consider the “paper ceiling” and why some library workers choose to pursue additional education after an MLS/MLIS. The authors' experiences demonstrate one route that can work for a variety of academic library professionals.”—Dustin Fife, series editor
- Rijt (2015) investigates the persistent underrepresentation of women in printed news media, coining the term “paper ceiling” to describe systemic exclusion. The study finds that women are less frequently cited, quoted, or featured in news stories, even when accounting for expertise and relevance. Structural biases in editorial decision-making and sourcing practices contribute significantly to this gap. The paper suggests that visibility inequality, not lack of qualification, drives the disparity. It calls for institutional changes to improve gender representation in news reporting.

Objectives

- To analyze the influence on degree-based hiring practices on the career opportunities and growth of skilled IT professionals without formal educational credentials.
- To evaluate the effectiveness of skills-based hiring process in promoting diversity, equity, and inclusion within IT organizations.

Methods

The mixed research method is established by combining the quantitative and qualitative approach.

Both descriptive and exploratory research are taken to understand the paper ceiling with comparing the degree-based hiring. The prevalence and patterns of degree-based verses skilled based hiring can be discovered by using quantitative approach where as to understand the deep insights can be understood by qualitative approach. Both descriptive and exploratory research type has used to map current and trends in IT industry and underlying causes and consequences of the paper ceiling and evaluate the hiring process.

The data collected from the survey questionnaires and semi structural interviews administered to HR managers, recruiters and information technology workers. Also, took data from industry reports, market trends, academic reports and reputed journals. The simple random size was selected and around 158 respondents' data were recorded through online channels such as LinkedIn and google forms and personal interviews was scheduled with 17 selected individuals.

The statistical tools used in this research are average, cross tabulation and correlation and regression analysis for obtaining the accurate information and assists in findings the facts and can suggest possible suggestions.

Hypothesis

To evaluate the effectiveness of skills-based hiring process in promoting diversity, equity, and inclusion within IT organizations.

H1: There is an association between degree-based hiring on career opportunities without formal educational credentials

H2: There is an association between effectiveness of skills-based hiring process in promoting DEI

Scope of the study

The paper emphasis on the practices of hiring in the Bengaluru information technology industry specifically degree-based hiring holders with the skilled based respondents. It highlights how formal education affects the career opportunities for skilled people those acquired skills through non-conventional methods such as certifications, online web platforms. The study analysis the challenges faced by the professionals and how move towards career growth within organizations. And also, examines skills-based hiring practices towards DEI. The paper suggests for HR leaders and policy makers in the hiring decisions.

Limitations

- The samples taken for the study was not sufficient and do not represent whole IT professionals
- The study is limited to selected information technology firms of Bengaluru
- Assessing the impact of skills-based hiring on DEI outcomes involves complex variables that may not be entirely captured through available metrics and tools.

Data analysis

1 – Strongly Disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly Agree

Statement	5	4	3	2	1
Degree-based hiring limits job opportunities for skilled professionals without degrees.	17	28	54	21	38
I have experienced discrimination in hiring due to the lack of a formal degree.	35	26	21	32	44
Employers prioritize degrees over practical skills in recruitment processes.	27	35	15	28	53
Lack of formal education has affected my career growth despite having the required skills.	37	32	25	16	48
Degree-based hiring affects the motivation of self-taught or informally trained IT talent.	28	24	23	32	51

The data reflects ideas about degree-based hiring patterns among IT practitioners, showing mixed but strong evidence of concern. A good number of respondents agree that degree-based hiring restricts jobs for qualified candidates without degrees (17 strongly agree, 28 agree), but many disagreed (21 disagree, 38 strongly disagree), comparing opinions here is somewhat preliminary. On feeling discriminated against, 61 respondents agreed, while 76 disagreed - although many felt discrimination, many (and a larger number) felt no discrimination. Perception of employers whom hire

degree holders over employees with skills was somewhat more moderate, with 62 agreeing compared to 81 that disagree, again, their experiences must differ. There is an important concern where not having formal education has affected professional development, with 69 respondents who feel this is the case, this does indicate educational credentials have an effect on development. The response to the degree-based hiring's effect on the motivation of self-taught employees do demonstrate the issue still exists to a degree (52 agreed versus 83 disagreed), but again, just because one self-taught programmer felt demotivated by the degree requirements, does not mean others did as well. Overall, we can definitively say that while not 100% one sided, there is a consistently strong trend of concern over the biases towards relying on formal qualifications over individuals' skill, generally towards qualified candidates that did not follow the traditional routes of formal and expensive education thereby justifying the need for more skills-based hiring models

Statement	5	4	3	2	1
Skills-based hiring has improved the representation of candidates from diverse backgrounds in our IT workforce.	60	50	20	18	10
Skills-based hiring has helped reduce bias based on gender, caste, or socio-economic background.	50	40	30	20	18
Candidates from non-traditional education backgrounds (e.g., bootcamps, online certifications) are treated equally in hiring decisions.	40	45	33	20	20
Our organization has seen measurable improvements in workplace inclusion since implementing skills-based hiring practices.	65	40	20	18	15
The hiring process in our organization is fair and inclusive for candidates without formal degrees but with relevant skills.	24	27	30	32	45

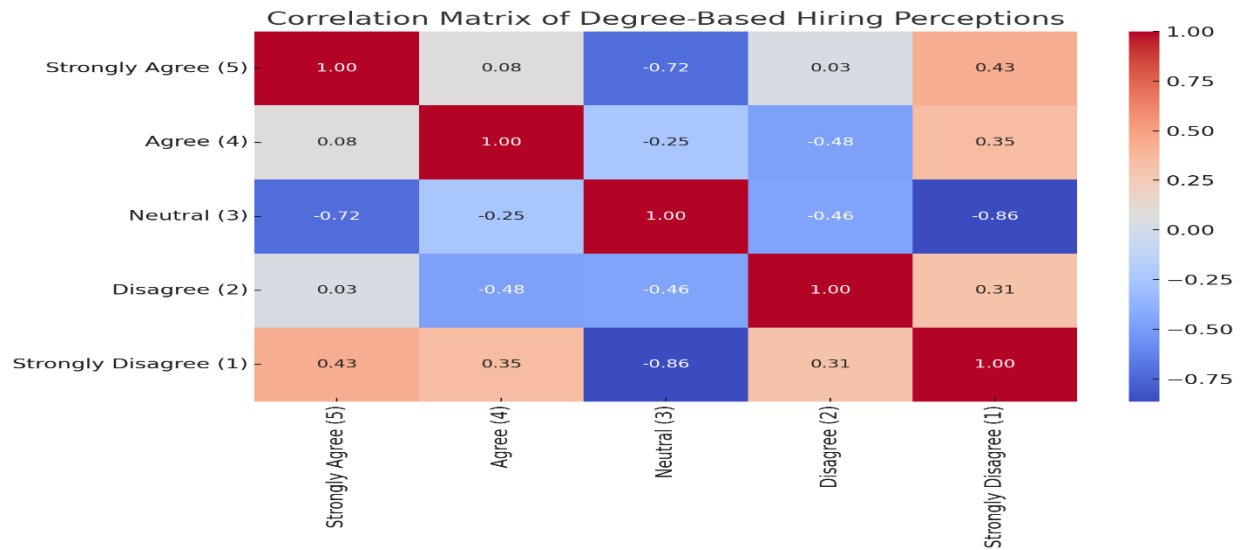
The data provides a detailed picture of how skills-based hiring practices impact diversity, equity, and inclusion (DEI) in IT. A large majority agree that skills-based hiring improved representation of diverse candidates (110 agree vs. 28 disagree). This sends a positive signal about workforce composition effect. A similar pattern of agreement is present for the idea that it has reduced bias around gender, caste or socio-economic background (90 agree vs. 38 disagree); but we are still measuring hesitancy.

Responses might be characterized as mixed for the equitable treatment of non-traditional candidates in their hiring experience; 85 respondents agreed and 40 respondents disagreed with the statement, which suggests progress, there is likely still some residual perception, or concerns about practice. The strongest agreement in our dataset is linked to the statement that skills-based hiring improved workplace inclusion in support of cultural benefit, where 105 respondents agreed.

In structural comparison, we see a considerable change in sentiment when participants evaluated to what extent they felt the hiring process is fair and inclusive for candidates without formal degrees. Here we see significantly different responses, as only 51 respondents agreed, and 77 disagreed that candidates without formal degrees experienced inclusivity attributed to skills-based practices. This tells us that although there were skills-based practices adopted, there exists the perception of systemic bias or inequity of access for candidates without formal degrees.

In short, while skills-based hiring seems to positively impact DEI and inclusion particularly through bias reduction, there remains a perceived gap in consistent, equitable practices for candidates from non-traditional educational backgrounds.

Correlational Analysis: Degree Based Hiring Perceptions



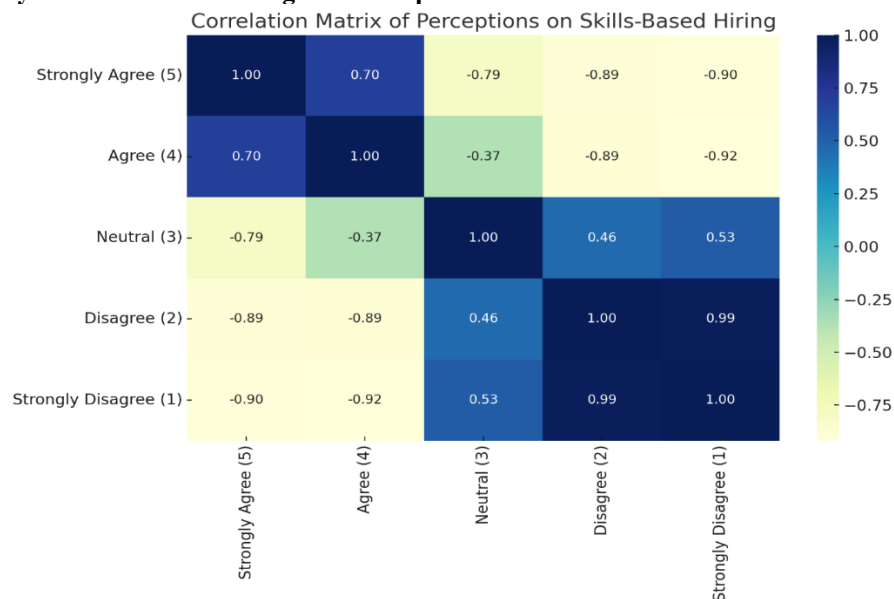
The **hypothesis H1**: There is an association between hiring for degrees and career opportunities for people without formal educational credentials is supported by the survey data and correlation analysis.

Quite a few respondents indicated agreement with the statements that hiring based on degrees limits opportunities and that not having a degree affects your ability to grow in a given career. The statements reflect the perception many apparently have about degree requirements and how they adversely affect people who are talented and skilled but just didn't get the formal education that some feel is necessary to warrant their hiring.

The correlation analysis bolsters this further, revealing robust negative correlations between neutral and extreme responses. This clustering of similar views and strong agreement across the statements suggests that the respondents who see degree-based barriers also see other related problems and express very similar concerns across those problem areas. In short, if you see the problem in one area, you are likely to see it in several others as well.

The frequency data and correlation findings work together to validate the hypothesis. They confirm that hiring based on degree is linked, in a very meaningful way, to the lack of educational opportunity for non-degree IT workers.

Correlation analysis: Skills-Based Hiring and Perceptions of Inclusions



The large positive and negative correlations show considerable internal consistency in how respondents think about the impact of skills-based hiring. Those who believe it helps with diversity, bias and inclusion also see fairness for

non-degree holders. By contrast, those who disagree on one dimension are likely to disagree on all other dimensions. This statistical trend lends support to the idea that skills-based hiring is viewed as a potent and comprehensive circuit-breaker to the promotion of workplace diversity and inclusion. though it also reveals a polarized perception between supporters and skeptics

Overall, your survey data, reinforced by consistent correlation patterns, and bolstered by external evidence on measurable DEI impact, **affirm H2: skills-based hiring** is effectively associated with improved diversity, equity, and inclusion in the IT industry.

Discussion

There is a distinct split about degree-based vs skill-based hiring in the IT sector as the analysis shows. Many respondents also expressed a strong belief that hiring based on qualification for degree blocks opportunity and would undermine the progression of talent without paper certificate. Correlation patterns confirm these fears with high conformity between people that feel such biases. Conversely, skills-based hiring is generally viewed as a positive force in diversity and reducing bias. The consensus among most participants is that this has increased inclusion, though doubts persist about equity toward those without degrees. The correlation dimension shows that respondents express constantly in favor or against such practices, signaling a polarized yet significant perception tendency. It's clear that progress is being made, but the transformation toward inclusive, skills-first hiring remains uneven, these findings confirm.

Conclusion

The paper concludes that degree-based hiring is commonly understood to be a restriction to advancement for skilled individuals working without degrees, supporting opinions of the “paper ceiling” within IT. By contrast, skills-based hiring is widely viewed as a sound and positive method for improving diversity, equity and inclusion (DEI). Yet, despite its promise, problems in practical application and the perception of bias indicate that more is needed to make hiring fair for all candidates, regardless of education.

Further scope of the study

The study offers a number of options for further research. Although the present study concentrated on the Indian IT industry, such an investigation can be carried forward in many other sectors in other localities, to compare hiring behaviors and culture effects on the education-based bias. Longitudinal studies may help to illustrate the changing influence of skills-based hiring on career pathways, organizational diversity, and employee retention. It would also be valuable to further investigate the potential for AI-enabled recruitment tools – eg, whether such tools either contribute to or reduce learning barriers. Cognitive-mapping in employer's views in terms of the obstacles in moving from a degree orientated to a skill orientated model could also be further explored by future research. Policy-level analysis could also provide guidance on how government and industry frameworks can continue to promote inclusive, skill-based hiring ecosystems.

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