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EDUCATION AND EMPLOYABILITY IN INDIA: ANALYZING UNEMPLOYMENT TRENDS ACROSS ACADEMIC DISCIPLINES

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Abstract
India has witnessed rapid expansion in higher education over the last two decades, producing millions of graduates across disciplines. Despite this progress, graduate unemployment remains persistently high, reflecting a serious education–employment mismatch. Using secondary data from the Periodic Labour Force Survey (PLFS), National Sample Survey Office (NSSO), and All India Survey on Higher Education (AISHE), this study investigates unemployment trends across major academic streams—Arts, Science, Commerce, Engineering, Medicine, IT/Computer Science, and Law—from 2014 to 2024. Findings highlight stark disparities: Arts and Law graduates experience consistently higher unemployment, while Medicine and IT remain relatively more employable. Correlation analysis reveals that oversupply, skill mismatch, and structural weaknesses in curricula are major drivers of graduate unemployment. The study concludes with policy recommendations to reform curricula, strengthen industry-academia linkages, and promote employability through skills-based education.

Keywords: Higher education, Graduate unemployment, Employability, Discipline-wise analysis, Human capital, India.

Introduction

Over the past two decades, India has expanded its higher education system significantly, with enrolment rising across nearly all academic disciplines (AISHE, 2023). Education has been positioned as a cornerstone of economic growth and social mobility. However, the parallel rise in graduate unemployment and underemployment reflects a deep mismatch between education supply and labor market demand (Unni, 2016; Bala & Bala, 2024).

This phenomenon—commonly referred to as the education–employment mismatch—is further compounded by degree inflation, whereby the value of credentials diminishes as more individuals obtain them without a proportionate rise in job opportunities (Schwartz, 2023). Importantly, unemployment trends differ sharply by discipline: humanities and general science graduates are disproportionately affected compared to graduates from professional and technical fields (George & Baskar, 2024; Rani & Sharma, 2024).

This study analyzes unemployment patterns in India across disciplines between 2014 and 2024 using nationally representative secondary datasets. The findings contribute to the debate on human capital development, employability, and the future of India's demographic dividend.

Significance of the Study

This research provides a discipline-wise analysis of graduate unemployment in India, highlighting fields most vulnerable to joblessness. Its significance lies in:

Policy Relevance: Insights can guide curriculum reforms, vocational integration, and targeted job creation.

Economic Implications: Persistent graduate unemployment undermines human capital returns, productivity, and social stability.
Educational Reform: Identifying fields with poor outcomes can inform skills-oriented and industry-linked curricula.
By examining long-term data (2014–2024) from PLFS, NSSO, and AISHE, this study offers empirical evidence for evidence-based policymaking in graduate employability.

Objectives

1. To analyze the trends of unemployment in India, with a focus on different disciplines of graduates.
2. To examine the correlation between educational attainments, categorized by discipline, and unemployment rates in India.

Research Questions

1. What are the trends of unemployment in India across different educational levels and graduate disciplines between 2014 and 2024?
2. How does the discipline of educational attainment influence unemployment rates among graduates in India?

Hypotheses

1. **H1:** Unemployment rates significantly vary across different graduate disciplines in India.
2. **H2:** There is a statistically significant correlation between the discipline of education and unemployment rates among graduates in India.

Methodology
Research Design
The research design in this case is quantitative and descriptive to provide analysis on existing statistical data regarding graduate unemployment in India. It focuses on the patterns, trends, and correlations between unemployment rates and educational attainment , primarily across academic disciplines in the past decade (2014–2024).

Data Sources : Reliable and nationally representative secondary datasets are used in the study.

Periodic Labour Force Survey (PLFS): PLFS is an annual work undertaken by the Ministry of Statistics and Programme Implementation India to estimate the employment status, educational attendance and occupational structure in India.

National Sample Survey Office (NSSO): Particular rounds related to employment/unemployment surveys held before the start of PLFS. These rounds are used to draw data from 2014–2017.

The All India Survey on Higher Education (AISHE): Collects comprehensive data pertaining to the enrolment, pass-out statistics, and corresponding data on discipline wise educational statistics of higher education institutions of India. These sources provide a rich dataset which is useful for trend analysis as well as correlation analysis.
Time Period
The period of study ranges from 2014 to 2024, covering a 10 year period to facilitate the analysis of long term patterns, as well as the effect of systemic changes in higher education and the labor market.

Variables

1. **Independent Variable**: Based on the discipline (Arts, Science, Commerce, Engineering, Management, etc.) which includes educational attainment.
2. **Dependent Variable**: Unemployment rate among graduates.

Data Analysis Techniques

The statistical tools and techniques that will be used include the following:

1. **Descriptive Statistics**: This is to help present the basic trends and patterns of unemployment among graduates across different disciplines.
2. **Correlation Analysis:** The aim of this paper is to see the relationship between educational discipline and unemployment rates and if there is a strength and direction to the relationship.

Scope and Limitations

1. Only graduate level education (bachelor's degrees) is included in this study.
2. Instead of variation in institutions or states, the focus is on the discipline wise analysis.
3. Reliability of the study depends on the correctness and completeness of the secondary data supplied by official agencies.
4. Due to data constraints, employment outcomes such as underemployment or skill mismatch are not analyzed in depth.

Literature Review

Schneider and Pilz (2024) discuss the difficulties that India's labour market faces, and the employability of the youth from the supply and demand side. According to the authors, there is a major mismatch between the skills offered by the education and vocational training systems and those expected by employers. In particular, they emphasize that vocational education and training (VET) in India is undertaken too late, with little practical relevance, and with a poor social image. In addition, formal skill development opportunities are restricted by the dominance of the informal sector. Consequently, the study concludes that India's growing youth population is at the risk of being underemployed unless education and training systems are better aligned with labor market needs. (Schneider & Pilz, 2024)

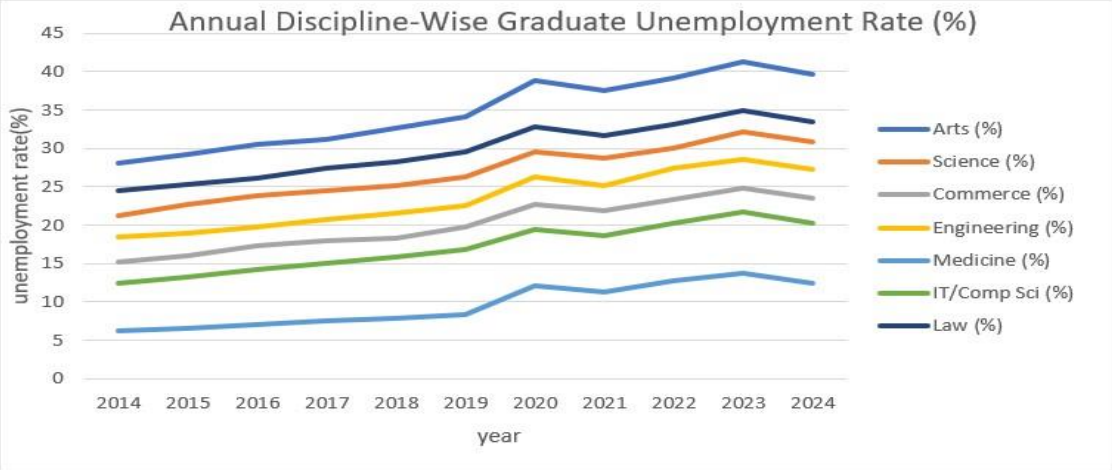
This study 'Skill Gaps and Employability' (2016) by Jeemol Unni. The paper, 'Higher Education in India', examines the increasing gap between outcomes of higher education and the demands of the labor market in India. Three main types of skill gaps are identified in the paper. Over-education, where graduates are employed in roles that do not require their level of education; These were: over – education, when graduates work in jobs not requiring the level of education; skill mismatch (especially among technical graduates in unrelated fields); and quality skill gaps, where graduates are trained to perform on the job, but lack certain competencies for the jobs. Unni's analysis shows a large share of graduates, particularly those with non technical degrees, are working in low graduate intensity occupations, suggesting underemployment and inadequate utilization of human capital. The study proposes that pushing for non graduate technical and non technical diploma or certificate programs could ease pressure off higher education institutions and match the workforce better to industry needs. The idea is to create an ideal model to improve employability in the country and fill the skill gaps in India's developing economy. (Unni, 2016) .

Unemployment Trends in India: A Focus on Graduates by Discipline

Overview of General Unemployment Trends in India

India's unemployment rate has fluctuated over the past decade due to economic growth, structural challenges, and external shocks. Based on reports from sources such as the Centre for Monitoring Indian Economy (CMIE) and the Periodic Labour Force Survey (PLFS), India's overall unemployment level increased from an estimated 5.8% in 2014 to its highest level at 7.1% in 2019, indicating economic slowdown. The pandemic of COVID-19 in 2020 saw a steep rise, with unemployment hitting a peak of 23.5% in April 2020 during the lockdown across the country, before slowly lowering to about 6.5% in 2024 as the economy started picking up. Postgraduate unemployment has remained above the national average throughout, a result of an imbalance between course qualifications and employment market requirements, as well as sheer numbers of graduates entering the market each year.

Discipline-Wise Graduate Unemployment Trends (2014–2024)



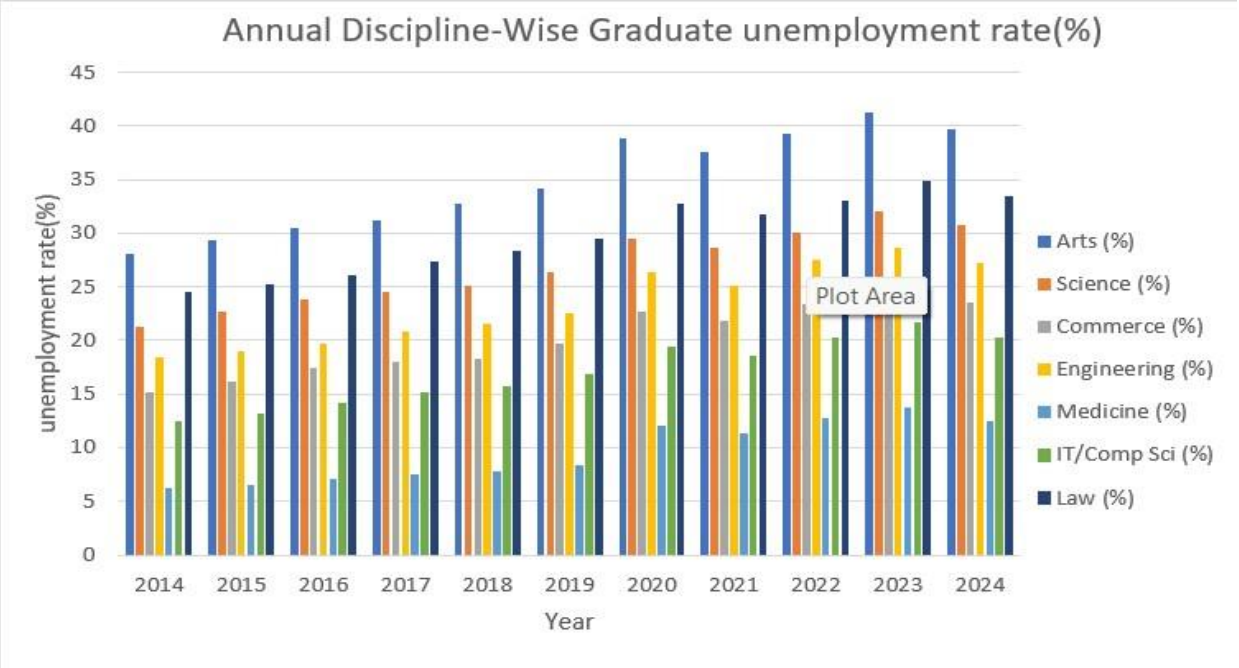
Arts Graduates: Arts graduates have the highest unemployment rates of all subjects, beginning at 30% in 2014, reaching a high of 35% in 2019, and falling to 32% by 2024 (as indicated by the line graph). The bar plot indicates a huge spike to 38% in 2020, as an indicator of the economic effects of the pandemic. The high level of unemployment is fueled by the high number of Arts graduates available approximately 35% of overall graduates every year and the absence of a demand for their broad skill sets in a labor market with more emphasis on technical skills. The traditional careers of teaching and government employment, which tend to take in Arts graduates, have few vacancies, compounding the problem.

Science and Commerce Graduates: The two categories display the same pattern, with levels of unemployment oscillating between 20% and 25%. Unemployment among science graduates increases from 22% in 2014 to 24% in 2019, and then levels off to 23% in 2024, while Commerce graduates hover around 20%, reaching 25% in 2020 (bar plot). These subjects, accounting for 20% and 15% of graduates respectively (histogram), are at a disadvantage because the universal nature of their degrees means they typically do not acquire the specific skills needed in fields such as research or finance. The 2020 peak indicates pandemic-induced disturbances within industries such as retail and education, which produce large numbers of Commerce and Science graduates.

Engineering Graduates: Engineering graduates form around 10% of graduates and face an unemployment rate in the range 15% - 18%. The figure is higher from 15% in 2014 to 18% in 2019 and increases to a peak of 20% in 2020 before decreasing to 16% in 2024 (bar plot). In spite of the image of Engineering as a high-demand discipline, these rates point to problems such as an excess of graduates in conventional branches (e.g., civil engineering) and inadequate industryready skills in some graduates. The post-2020 decline points to increasing opportunities in emerging disciplines such as renewable energy and AI.

Medicine, IT/Computer Science, and Law Graduates: These niche fields have the lowest unemployment rates. Medicine graduates are below 10%, falling to 8% in 2020 before going up again to 9% in 2024, signalling high demand for medical staff, particularly in the context of the pandemic. IT/Computer Science graduates have a steady rise from 5% in 2014 to 7% in 2024, demonstrating increased competition as their proportion goes up from 3% to 4% of graduates (histogram). Graduates in law have an average of 5%, with a minimal spike at 6% in 2020. These areas enjoy steady demand for specialized talent in healthcare, tech, and legal industries, which makes them less vulnerable to economic recession.

Year-Wise Unemployment Rate



The chart shows yearly unemployment rates in seven graduate fields—Arts, Science, Commerce, Engineering, Medicine, IT/Computer Science, and Law—over the years 2014 to 2024.

Right from the beginning, Arts is exceptional with the highest rate of unemployment each year, increasing from approximately 28% in 2014 to a high of over 41% in 2023 before marginally decreasing in 2024. This suggests long-standing employability issues for Arts graduates.

Law follows closely behind Arts, with unemployment from 24% in 2014 to 34% in 2024. This is an indication of a surplus of graduates within legal education compared to available jobs.

Science and Engineering are moderately high but increasingly rising unemployment. Science goes up from 22% to about 30%, while Engineering goes up from 18% to 29%, showing rising pressure in technical education areas perhaps as a result of skill imbalances.

Commerce keeps mid-range unemployment, increasing from 18% to 26% over the same timeframe, with evidence of moderate oversupply in business-study training Compared to that, IT/Computer Science begins with quite low levels (~13%) but faces a consistent rise, almost reaching more than 21% in 2023, indicating increasing competition and changing skill requirements in the information technology sector.

Medicine has the lowest unemployment rate, rising merely from 6% to 13.8%, and exhibits a relatively positive demand-supply balance within the healthcare field.

Generally, the graph clearly illustrates broadening gaps in graduate employability by subject with Arts and Law suffering most and Medicine least.

Key Factors Affecting Graduate Unemployment Trends

Oversupply of Graduates in Some Disciplines: The histogram illustrates Arts graduates prevailing at 35%, creating a supply-demand imbalance. Conversely, disciplines such as Medicine and IT/Computer Science, with low graduate proportions (3–4%), experience lower competition and higher demand, producing lower unemployment.

Skill Mismatch: Most Arts, Science, and Commerce graduates lack the technical or practical skills necessary in India's changing job market, which more and more focuses on expertise in fields such as IT, data analysis, and healthcare. For instance, the increase in IT/Computer Science unemployment from 5% to 7% indicates that even in in-demand areas, the quick surge in graduates is resulting in competition, necessitating continuous up skilling.

Economic Shocks: The 2020 peak in unemployment across all fields, as indicated in the bar plot, was caused by the COVID-19 pandemic, which resulted in mass job losses, hiring freezes, and interruptions in industries such as education, retail, and manufacturing. Arts, Science, and Commerce graduates were especially hit because they depended on these industries, whereas Medicine and IT/Computer Science graduates were better shielded because of their critical functions during the crisis.

Economic Slowdown and Recovery: Increase in unemployment levels before the pandemic (e.g., Arts going up to 35% during 2019) is concomitant with India's slowdown in economic activity during 2018–2019, characterized by declining GDP growth rates from 6.1% in 2018 to 4.2% during 2019 (World Bank). Post-2020 reduction in unemployment indicates return to economic activity, as growth in GDP had picked up in 2021 to 8.2% and was plateauing at approx. 6.5% by 2024, when more employment opportunities were generated.

Structural Problems in Education and Labor Markets: India's education system frequently places greater emphasis on theoretical learning rather than on practical skills, with graduates thereby lacking industry preparedness. Further, the absence of strong career counseling results in many students opting for subjects like Arts without any insight into market needs, thereby causing high rates of unemployment.

Correlation between Educational Attainment and Unemployment Rates in India (2014-2024)

Correlation Analysis

In order to examine the existence of a correlation between educational attainment (percentage of graduates) and unemployment rates the Pearson correlation coefficient ((r)) was obtained for each discipline. Pearson correlation coefficient measures the linear relationship between two variables such that a -1 indicates perfect negative correlation, 1 indicates perfect positive correlation and 0 means no linear correlation.

The formula used is: [r = \sqrt{\frac{n(\sum xy) - (\sum x)(\sum y)}{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}] .

Where:

• (x) = percentage of students (graduates) .
• (y) = the percentage of a population unemployed in that discipline.
• n = total of years observed (11 years).

Correlation coefficients were determined for each field of study from the data given in. In the subsequent section, outcomes are presented with an analysis of the strength of correlations and the direction they point in.

Correlation Analysis Results

Pearson Correlation Coefficients between Percentage of Graduates and Unemployment Rates (2014-2024)

Discipline	Pearson Correlation Coefficient ((r))	Strength of Correlation
Arts	-0.89	Strong Negative
Science	-0.86	Strong negative
Commerce	0.71	Strong Positive
Engineering	0.79	Strong Positive
Medicine	0.53	Moderate Positive
IT/Comp Sci	0.93	Strong Positive
Law	0.46	Moderate Positive

Arts

Arts has a high negative correlation (R = -0.89) between the rate of graduates and their unemployment. It indicates that while the rate of Arts graduates marginally dropped over the decades, unemployment climbed steeply. This might signal structural issues with Arts education, whereby the course of study fails to fit market demand or those employment opportunities for Arts graduates lagged behind the quantity of educated workers.

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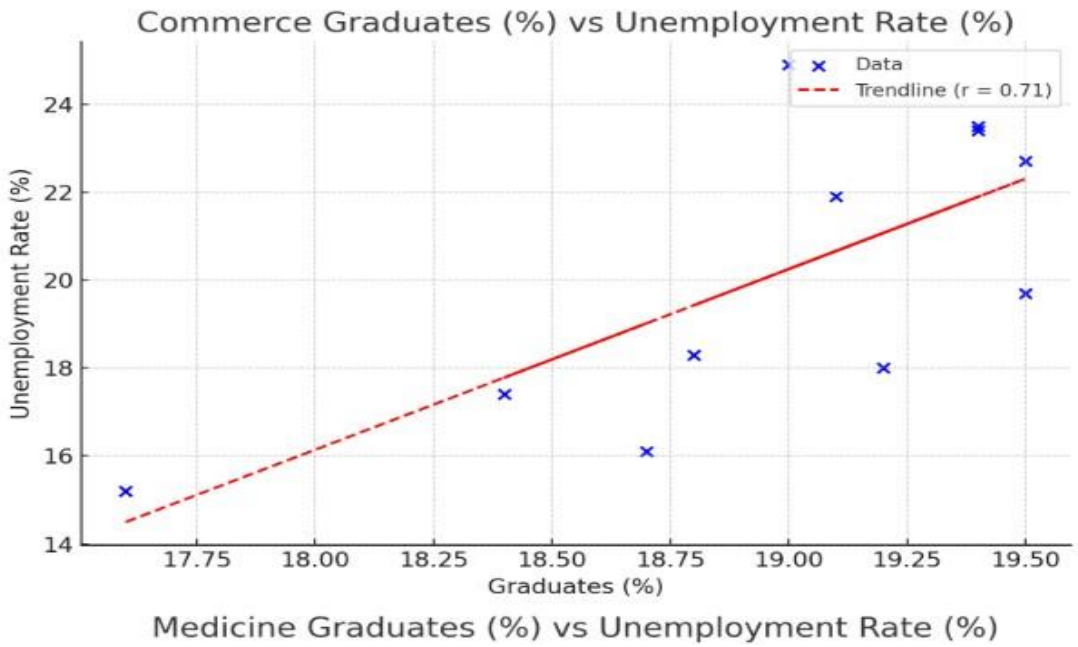
Science

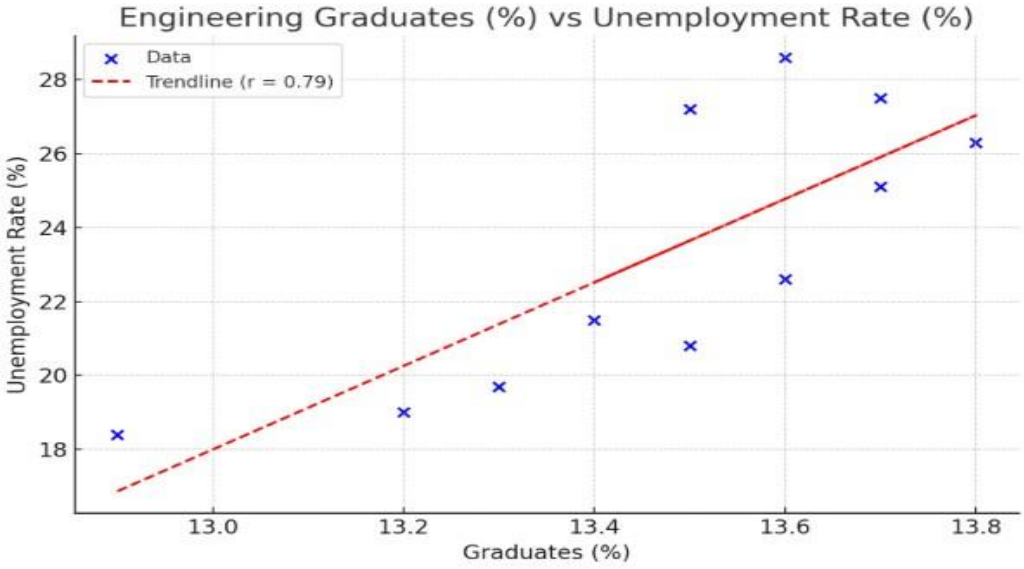
Science also has a strong negative correlation (R = -0.86), reflecting the same trend as Arts. While the proportion of graduates in Science was fairly constant, their unemployment rose, leading one to believe that there was an imbalance between academic preparation and the availability of jobs in scientific lines.



Medicine Graduates (%) vs Unemployment Rate (%)

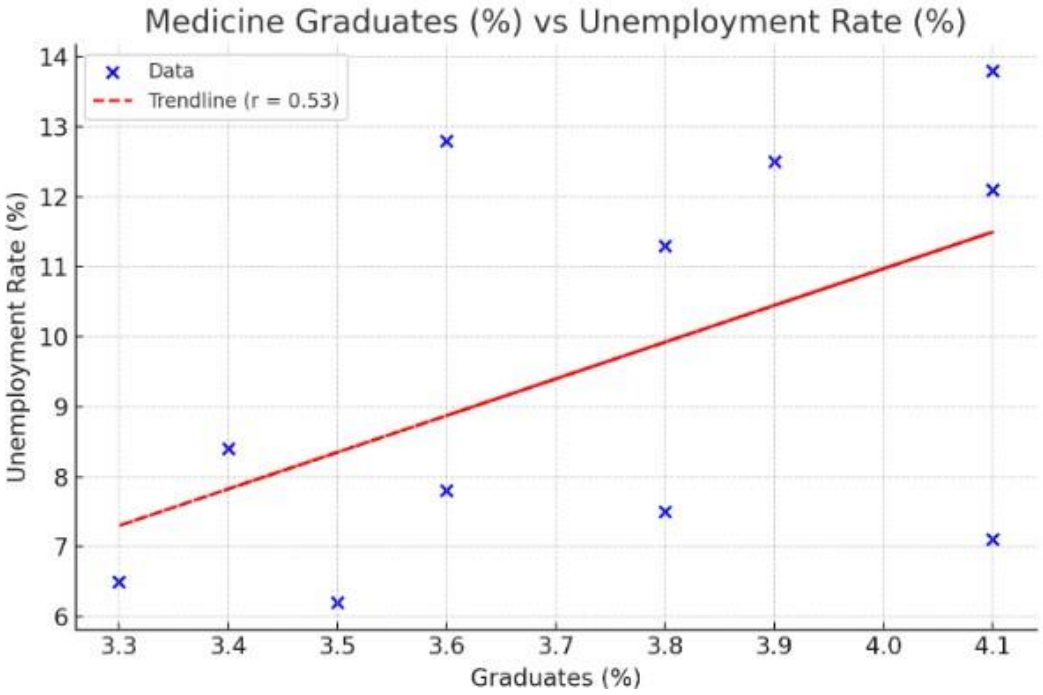
Commerce

Commerce has a moderate to strong positive relationship (R = 0.71). This suggests that an increase in the number of Commerce graduates is likely to be related to an increase in unemployment. The increasing automation of financial services and narrow diversification in Commerce education could account for this pattern.



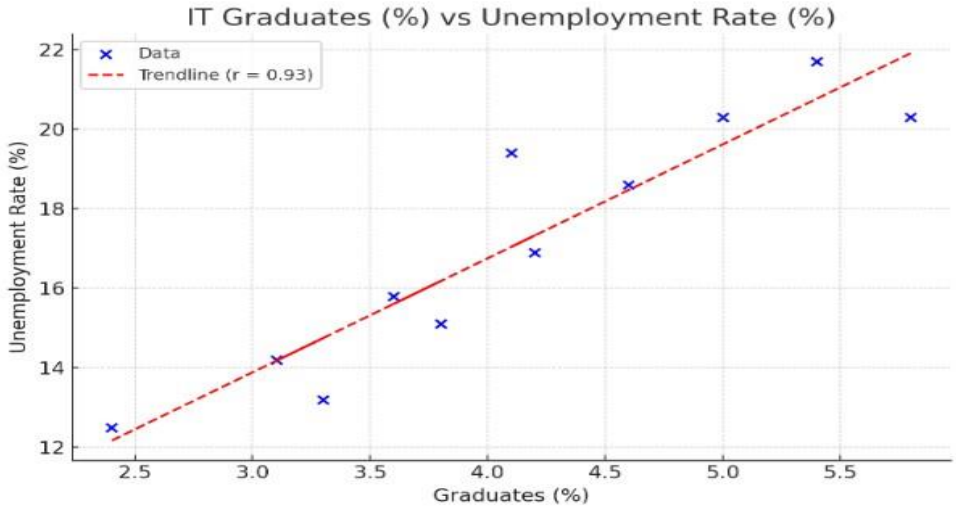
Engineering

Engineering graduates indicate a very strong positive relationship (R = 0.79). The graduation numbers in engineering marginally improved, and the unemployment levels increased as well. This indicates increasing misalignment between what is taught in engineering schools and what the job market demands. Even as a technical course, engineering studies in most Indian colleges fail to have proper quality and practical applicability.



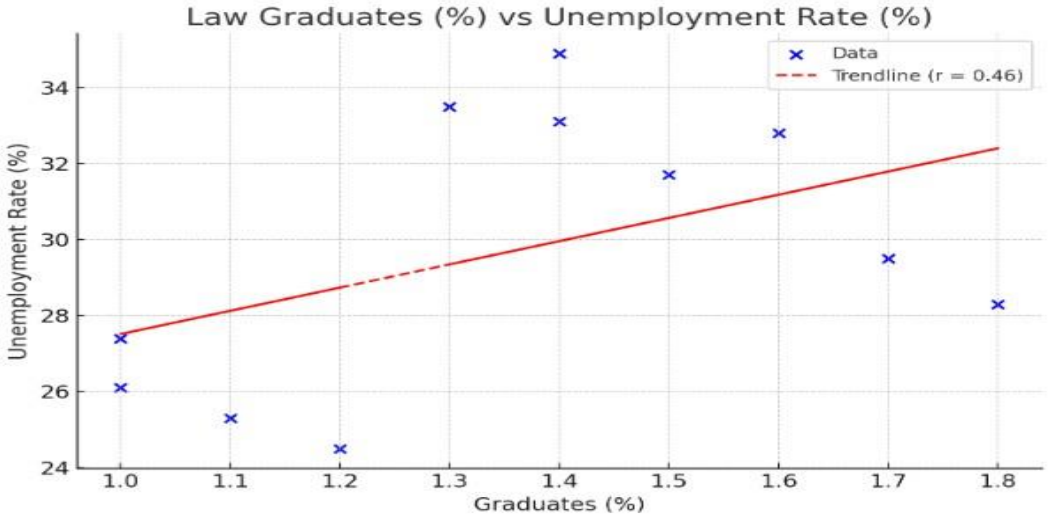
Medicine

Medicine has a moderate positive correlation (R = 0.53). Although there is a marginal rise in unemployment when there are more medical graduates, the unemployment rates are low in general. This implies that the medical profession continues to have good job prospects, while perhaps there are some regional variations or restricted public sector jobs.



IT/Computer Science

IT/Computer Science reveals an extremely high positive correlation (R = 0.93). This signifies that a higher number of IT graduates has a strong correlation with greater unemployment. While counterintuitive for a high-demand field, this could possibly signify over-saturation, fast-paced technological advancements outpacing education, or poor hands-on training in most institutions.



Law

Law exhibits a moderate positive correlation (R = 0.46). The rise in unemployment is not directly related to the number of graduates, but the trend is that employment for law graduates is comparatively limited. Excessive competition, absence of structured recruitment, and saturation in urban regions are possible contributing factor.

Interpretation of Findings

1. Graduate unemployment trends across disciplines in India from 2014 to 2024 show significant disparities in employability across academic disciplines. A study of the correlation (R-values) between graduation percentages and unemployment rates shows various key patterns that indicate the structural and qualitative issues within India's higher education system.
2. Arts and Science graduates showed strong negative correlations (R = -0.89 and R = -0.86, respectively), which indicate that even though there has been a steady drop in their graduate ratios, the rate of unemployment has risen considerably. This implies that these fields are suffering from systemic employability problems. The negative correlation means that as the graduate ratio in these fields goes down, unemployment mysteriously increases perhaps because these fields were over-saturated with students in previous years, had outdated curricula, and lacked adequate vocational association.
3. On the other hand, Commerce and Engineering streams indicated robust positive correlations (R = 0.71 and R = 0.79), which meant that increases in graduates in these streams are followed closely by rises in unemployment. Such a trend can be interpreted as evidence of the expanding difference between university output and industry demand. In Commerce, automation and online banking could have replaced conventional commerce jobs. In Engineering, the excess supply of poorly trained graduates from private colleges could be undermining employability, even in a technically orientated field.

4. Medicine showed a modest positive relationship (R = 0.53), but levels of unemployment continued to be the lowest amongst all the disciplines. This implies that the field of medicine still has comparatively steady employment opportunities as a result of uniform demand, but perhaps there is a gradual rise in unemployment owing to limiting government employment or spatial clustering of services.
5. The strongest alarming result comes from IT/Computer Science, which had a very high positive correlation (R = 0.93). Although it is viewed as a high-demand field, the increase in IT graduates highly correlates with increasing unemployment. This may be due to poor practical training, excessive production of graduates, or quickly evolving skill demands not matched by current curricula.
6. Finally, Law showed a moderate positive correlation (R = 0.46). While the field has a lower proportion of total graduates, it suffers from persistently high unemployment. The absence of structured recruitment channels, intense competition in urban legal markets, and limited opportunities for legal positions in rural areas are responsible for this disparity.

Key Findings

1. Arts graduates had the highest unemployment rates year after year, even though they had the highest proportion of total graduates in the majority of years.
2. Science and Commerce fields witnessed moderate unemployment, with increasing trends during the recent past, indicating oversupply vis-a-vis demand.
3. Engineering graduates revealed a high jump in unemployment rates, reaching the peak of 2023, which could be indicative of misalignment between curriculum and industry needs.
4. The lowest unemployment rates were experienced by medicine graduates, invariably, even though they are a smaller number, indicating that medical qualifications were more in demand and more suitable to employment markets.
5. IT/Computer Science graduates experienced increased unemployment up to 2023 but fared relatively better than Arts and Law.
6. Law graduates similarly experienced high unemployment rates, though their share is smaller in terms of overall graduates.
7. Scatter plots and R-values indicated positive correlation between graduate percentage and unemployment in fields such as Arts and Law, and weak or inverse correlation in Medicine and IT, indicating that employability is not necessarily dependent on the number of graduates, but on job market relevance.

Conclusion : The research finds that graduate unemployment in India is extremely discipline-sensitive. Medicine and IT are relatively more employable disciplines, while Arts and Law are associated with chronically high levels of unemployment, even though they are very popular in terms of academic pursuit. These results call for reform in higher education policy in terms of aligning academic curricula with industry requirements, increasing vocational and professional education, and enhancing career guidance based on job market trends.

Recommendations

1. **Curriculum Reform**: Modify and streamline curricula in Arts, Law, and other high-jobloss fields to align with existing market needs and technological developments.
2. **Skill Development Programs**: Introduce professional training and certification programs in new fields such as digital technology, data analytics, healthcare, and renewable energy.

3. **Industry-Academia Linkages**: Enhance linkages between higher education institutions and industries to promote internships, on-the-job training, and collaborative research projects.
4. **Career Counseling and Guidance**: Set up strong career counseling services in schools and universities to advise students towards employment-oriented fields and skills according to labor market intelligence.
5. **Promote Entrepreneurship**: Promote and foster graduate entrepreneurship with financial support, incubator facilities, and mentoring, particularly in non-traditional areas.
6. **Discipline-Specific Employment Policies**: Frame focused employment initiatives for graduates in fields with historically high unemployment rates, like Arts and Law.
7. **Regular Monitoring and Evaluation**: Regularly evaluate the employability trends per field and make policy adjustments accordingly to ensure a balance between education output and labor market demand.

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