Navigating the global jobs market: Assessing employability factors in Indian and international engineering graduates.

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*Abstract*—This comprehensive study investigates employability factors influencing both Indian and international engineering graduates in the global job market. Through an extensive examination of skill sets, educational backgrounds, and prevailing industry trends, this research endeavors to offer insights into the relative employability of two distinct groups. Specifically focusing on Indian engineering graduates seeking international employment, the study investigates the hurdles and prospects they encounter, encompassing factors such as cultural assimilation and language proficiency. Furthermore, it assesses how technological advancements and shifting industry needs influence the overall employability scenario for engineering graduates globally. Through comparative analysis of experiences, the study aims to provide valuable perspectives on the worldwide employment landscape for engineers, aiming to offer recommendations for educational institutions, policymakers, and industry stakeholders to bolster the employability of graduates, both domestically and internationally.

Keywords— Engineering, Job, Employability, efficiency, language proficiency, cultural assimilation, international, Indian, Policy.

# INTRODUCTION

# Navigating the global employment sphere presents hurdles for engineering graduates hailing from India and beyond. Recent surveys gauging employer satisfaction and critical skill sets have revealed significant discontent, with a substantial 64% expressing only moderate satisfaction or worse. This dissatisfaction isn't confined solely to Indian graduates but encompasses their international counterparts as well, emphasizing a shared concern. Recommendations aimed at alleviating this issue advocate for explicit measurement of learning outcomes, active engagement of accreditation agencies, and the implementation of nationwide quality enhancement initiatives. This paper delves into the nuanced landscape of employability factors among both Indian and international engineering graduates. Its objective is to furnish a thorough understanding of the challenges they encounter and offer strategies for enhancement on a global scale. By bridging the chasm between educational paradigms and industry expectations, this research endeavors to fortify the readiness and competitiveness of engineering graduates in the global job market. [1]

# Engineering graduates often face challenges entering the workforce. This paper investigates the reasons behind this, focusing on the disconnect between what engineering programs teach and the skills sought by employers. By analyzing these discrepancies, we aim to identify practical solutions to enhance graduate employability on local and international scales. Through collaboration between universities, industry experts, and policymakers, the proposed strategies aim to bridge the gap between education and industry needs, fostering a supportive environment for skill development and career growth. Ultimately, this research seeks to ensure engineering graduates possess the confidence and competence to navigate the global job market effectively.

# LITERATURE REVIEW

As per the findings presented in the document, there is a considerable level of discontentment concerning the quality of graduates, with 64% of employers indicating only moderate satisfaction or below with the current skill set of engineering graduates. This dissatisfaction underscores the necessity for renewed endeavors to enhance the skill set of upcoming engineers. Additionally, the document cites other studies that corroborate this dissatisfaction, revealing that a substantial percentage of Indian engineering graduates lack the employability standards required by multinational corporations. [1]

This paper highlights several factors affecting how easily Indian engineering graduates find jobs. These factors include both general skills like teamwork and communication (written and spoken English) and technical skills like applying knowledge, running experiments, and analyzing data. Importantly, the paper finds employers are dissatisfied with the quality of graduates. Surveys show employers only give new engineers an average satisfaction rating of 3.15 out of 5, with no single skill exceeding a 4.0. This suggests graduates lack the skills employers truly value. The document also references a 2005 report by NASSCOM and McKinsey, revealing that 75% of Indian engineering graduates were deemed unemployable by multinational companies. This stark statistic underscores the substantial disparity between the skill sets possessed by graduates and the requirements of employers, particularly prominent international corporations. Overall, the document emphasizes the challenges Indian engineering education faces in preparing graduates with the necessary skills for the job market. [1]

While a 2005 report by the National Association of Software and Service Companies (NASSCOM) and other multinationals found a low employability rate (25%) for engineering graduates by multinational companies, this paper focuses on a more recent data point: the 3.15 average satisfaction rating from employers. This suggests there might be some improvement since 2005, but a gap between graduate skills and employer needs still persists. [1]

Highlighted in the document is the factor analysis of skills, which divides them into three main categories: Core Employability Skills, Professional Skills, and Communication Skills. Notably, Core Employability Skills, encompassing attributes such as integrity, self-discipline, reliability, self-motivation, entrepreneurship, teamwork, and willingness to learn, emerge as particularly vital, exhibiting the highest level of importance on average. This discovery underscores the importance of personal characteristics within the broader skills landscape, as they collectively contribute to over 85% of the total variance. [1]

Alisha Mendez's study on circular migration among IT professionals in Kochi City highlights the development of new skills and competencies as a significant aspect of circular migration. The study emphasizes that exposure to different cultures, working environments, and technology platforms during circular migration can lead to the enhancement of IT professionals' employability and career prospects. Additionally, the study acknowledges the value of building professional networks through working in different locations, which can be leveraged for future opportunities. [2]

In order to ensure a comprehensive representation of stakeholders, encompassing both genders, the researcher collected data from both male and female respondents. The primary survey for this study consisted of approximately 58% male respondents and 42% female respondents. [2]

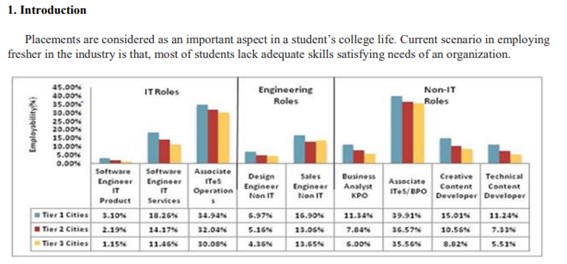
The BSc IT and BCA degrees both impart crucial technological abilities but have distinct emphases. BSc IT merges tech with business aspects, encompassing areas such as database systems, software crafting, and network management, readying graduates to oversee IT infrastructures that bolster business operations. On the other hand, BCA zeroes in on the core technicalities of computing applications and the creation of software, with an emphasis on programming syntax, organizational data patterns, and the blueprint of computing systems, thus priming graduates for the craft of software development. [2]

While BTech (Bachelor of Technology) in Computing and Information Technologies offers a broad curriculum encompassing computer science, information technology, and engineering, other degrees provide more specific focuses. The BSc IT program emphasizes how technology is used in businesses, and the BCA program strengthens skills in building software solutions. This distinction allows students to choose a program that aligns with their career aspirations, whether it's applying technology within businesses (BSc IT) or focusing on the core aspects of software development (BCA). [3]

Determining the superior degree among BSc IT, BCA, and BTech in the realm of Computing and Information Technologies poses a challenge. The context explores the prevalence and development of diverse computing and information technology programs in both Indian and international universities. However, it refrains from explicitly labeling any particular degree as the best. Instead, the emphasis is on the evolving eligibility criteria, the array of available programs, and the distinctions within computing and information-related fields, both domestically and globally. [3]

India is home to a considerable cohort of graduates specializing in technological studies, underpinned by an expansive infrastructure comprising more than 40,000 higher educational institutions. This includes 800 universities, 3,500 engineering colleges, and 5,000 management colleges. Within the computing domain, the discipline of Computer Science and Engineering holds prominence, being offered across numerous engineering colleges with degrees such as BE/BTech/ME/MTech. Furthermore, Information Technology programs present a diverse array of offerings at various levels, including BSc, BE, BTech, MSc, ME, MTech, MS, and MS (Research). This educational landscape has played a crucial role in fostering a skilled workforce, thereby making substantial contributions to both the technological and educational sectors in India. [3]

An analysis of enrollment developments spanning from 2010 to 2017 yields treasured insights into the higher schooling panorama. Engineering establishments witnessed an uptick in enrollments from three,222 within the academic year 2010–11 to a height of 3,495 in 2012–thirteen, followed by using a marginal lower to a few,288 enrollments in 2016–17. In assessment, MCA (grasp of laptop applications) applications exhibited a steady enrollment sample, retaining figures of one,198 enrollments in 2010–eleven and 1,241 enrollments from 2011–12 to 2016–17. those enrollment information underscore the dynamic nature of higher education in engineering and laptop applications, illustrating both growth and stability in response to evolving instructional needs and traits in India. [3]



Furthermore, the geographical dimension introduces another aspect to employability dynamics. Tier 1 cities stand out as centers of increased opportunities within the IT sector, providing a conducive environment for job seekers. Conversely, Tier 2/3 cities offer unique employment prospects, influenced by local economic factors and industry presence. Acknowledging these regional differences, students need to navigate these variations to make informed career decisions aligned with their aspirations and the prevailing job market conditions. [4]

Embedded within these statistics is a critical narrative highlighting the urgent necessity to bridge the gap between academic education and practical skills. Despite the evident demand for skilled professionals, a considerable number of students encounter difficulties in fulfilling organizational requirements Enhancing overall employability hinges on adopting a holistic approach that integrates theoretical knowledge with practical experience, ensuring that graduates are well-equipped to navigate the complexities of the ever-evolving job market. [4]

High rates of unemployment and underemployment are prevalent among graduates of engineering programs in India, who encounter numerous challenges including a deficiency in essential skills and inadequate utilization of their capabilities. These issues arise from a substantial mismatch in the skill sets of recent graduates and the changing needs of the labor market. Candidates with strong soft skills, such communication, teamwork, project management, and ethical awareness, are now given preference by employers over those with merely technical expertise. Graduates must also constantly refresh their technical knowledge in order to stay up to date with emerging technologies. These difficulties are made worse by things like inadequate facilities and resources at many engineering colleges, poor collaborations between academics and industry, low-quality education in some institutions, and a lack of skilled faculty. [5]

Confronting the issues that Indian engineering graduates encounter requires a multifaceted strategy that targets not only technical skill enhancement but also professional skill development, improved synergy between educational and industrial sectors, and remedies for infrastructural and educator scarcities. The goal should transition from just churning out technically adept graduates to cultivating dynamic professionals who are proficient in thriving within the competitive and fluid job market. The evolving employment landscape has shifted the employability focus, placing greater importance on soft skills. Skills such as effective communication, collaborative teamwork, skilled project coordination, and ethical insight are now prized by employers. This paradigm shift has increased the skills divide between what engineering graduates bring to the table and what the job market currently demands, causing higher instances of joblessness and underemployment in this cohort. A holistic strategy is imperative to bridge this divide and guarantee that engineering graduates are fully prepared to meet the requirements of today's job market.

Engineering graduates must adapt to the job market's shifting needs by honing key skills such as critical analysis, creative resolution of issues, and effective decision-making. The current educational models often do not keep pace with these changes, resulting in a prevalent skill deficiency. Moreover, the insufficient collaboration between academia and industry, along with a deficit of educators in engineering institutions, compounds the challenge for graduates to find appropriate jobs. As the necessity for a diverse skill repertoire grows, it is imperative to diminish the educational-industry gap. This involves embedding vital interpersonal skills within the educational syllabi and improving academia-industry cooperation to prepare engineering graduates for the changing landscape of the job market. [5]

In the Indian context, the salary prospects for engineering graduates are intricately linked to the reputation of the academic institutions they attend. Graduates hailing from top-tier colleges generally harbor higher salary expectations compared to their counterparts from lower-tier institutions. This inclination towards graduates from esteemed colleges is particularly evident among large corporations, often translating into more lucrative salary offers. Such tendencies significantly influence the employment landscape across different tiers of colleges. Moreover, discrepancies in salary expectations across genders and college tiers highlight the substantial influence of remuneration considerations on overall employment opportunities. Additionally, the employability rates vary across distinct sub-fields of engineering. Graduates specializing in electrical engineering and information technology boast the highest employability rates, exceeding 45 percent. Conversely, civil engineering records the lowest employability rate at 26 percent. Employability rates for other sub-fields, such as mechanical engineering, computer science engineering, and electronics & communications engineering, fall within these specified ranges. [5]

The paper discusses the need for engineering graduates to own a wide mixture of capabilities, information, and education that move past conventional engineering and science training. It emphasizes the call for for engineers with advanced competencies in innovation, entrepreneurship, excessive-generation management, and parallel intercultural verbal exchange. The paper also highlights the importance of engineers having commercial enterprise acumen, management talents, and communication capabilities similarly to technical prowess for you to force innovation and remain competitive inside the worldwide economy. [7]



Employability has expanded extensively in most OECD countries in the past half century. Today about half of each age cohort will participate in a higher education programs during their lifetimes and about a third will attain at least two years of tertiary education (Figure Below). There are differences between the educational levels in OECD countries. [6]

The chart supplied illustrates the percentage of women and men aged 25 to 64 with at the least two years of tertiary training within the years 2000 and 2013 across numerous nations. those international locations embody Canada, Japan, Finland, Estonia, the USA, New Zealand, Australia, Norway, Ireland, the United Kingdom, Sweden, Iceland, Denmark, Belgium, Korea, Luxembourg, Spain, the Netherlands, France, Slovenia, Switzerland, Poland, Greece, Germany, Hungary, Portugal, the Slovak Republic, the Czech Republic, Austria, Italy, Mexico, and Turkey. by way of comparing the information for each 2000 and 2013, the graph helps an exam of the changes in academic attainment inside this time frame. [6]

The chart delineates the salary anticipations of engineering graduates across various tiers of colleges and reveals gender discrepancies in salary expectations spanning the years 2014, 2016, and 2019. It portrays a trend where graduates from lower-tier engineering institutions tend to harbor lower salary expectations, potentially attributable to limited placement prospects and lesser engagement from prominent employers. Furthermore, it accentuates a gender divide in salary aspirations, with women generally expressing lower salary expectations compared to men. Despite minor fluctuations over the observed years, the overall average salary projections remain relatively conservative, escalating from approximately 3 lakhs per annum in 2014 to about 4 lakhs in 2019. Particularly noteworthy is the substantial variance in salary expectations between graduates from tier 1 and tier 3 colleges in 2019, indicating an escalating recognition of quality disparities among graduates by prospective employers. [5]

The article expresses apprehension regarding the caliber of recent engineering graduates in China and India, casting doubt on their preparedness to fulfill existing domestic and global market requirements. It underscores the necessity of generating well-trained engineers of superior quality who can rival their counterparts in the United States. Moreover, it sheds light on the prevalent problem of significant unemployment among engineering graduates in China and India, notwithstanding the substantial demand for their expertise from corporations. This disparity between high demand and unemployment rates among engineering graduates raises concerns about the overall quality of recent graduates from these nations. [7]

The paper delves into the employability landscape of recent engineering graduates in China and India, emphasizing a paradoxical scenario where significant unemployment persists among engineers in both nations despite a high demand for top-tier graduates. It elucidates that while there exists an oversupply of engineers overall, there is a dearth of engineers who possess the requisite skills to compete on a global scale. Citing a 2005 McKinsey Global Institute survey, the paper reveals that merely 10 percent of Chinese engineers and 25 percent of Indian engineers were deemed globally employable, in stark contrast to 80.7 percent of U.S. engineers. The survey further identifies several barriers to employment for foreign engineers, including concerns regarding education quality, cultural disparities, and limited accessibility to major urban centers. [7]

The paper mentions that the researchers conducted interviews in prominent MNCs that were hiring Chinas and India's top engineering graduates, and also toured R&D centers during their research in China and India. These interviews allowed the researchers to complete their datasets, especially on the post-baccalaureate side, and to learn more about the quantity and quality issues that shape global engineering. [7]

The specific skills that IT graduates in India lack in terms of employability include:

Communication

Problem-solving

Decision-making

Critical thinking and innovative skills

Teamwork

Professionalism and ethical behavior

Self-management

Planning and managing skills

These skills are identified as essential for IT graduates to be job-ready and employable in the industry. [8]

If the dearth of employability skills amongst IT graduates in India remains unaddressed, it could result in numerous capacity effects:

1. Unemployment: Graduates can also encounter trouble in securing suitable employment opportunities due to their deficiency in task-ready abilities, main to better charges of unemployment and underemployment.

2. financial impact: The economic system ought to suffer from having a vast pool of underutilized talent, adversely affecting productiveness and innovation within the IT zone, which plays a essential function in India's financial system.

three. competencies Mismatch: There may be a large hole between the capabilities possessed by way of the available personnel and those demanded through the rapidly evolving IT enterprise, exacerbating the industry's battle to fulfill market demands.

four. reduced Competitiveness: the global competitiveness of the Indian IT industry can also decline if its staff lacks the requisite talents to compete efficaciously on an international scale, doubtlessly dropping marketplace percentage to competition from different nations.

five. stress on education system: The higher schooling device might also face elevated strain to produce graduates ready with the necessary employability skills, main to demanding situations in curriculum improvement and educational delivery methods.

6. Stagnation of Innovation: without the important competencies, graduates may additionally warfare to make contributions to technological improvements and innovation within the IT area, impeding its boom and development.

7. Employability gap: A widening gap may additionally emerge among the abilities demanded by way of industry employers and those possessed by using recent graduates, resulting in a disconnect among the desires of employers and the capabilities of the group of workers.

8. Social effect: high charges of unemployment and underemployment among IT graduates will have negative social effects, affecting individuals' well-being and contributing to social instability inside communities.

Addressing these problems is imperative to ensure that IT graduates in India are correctly geared up to satisfy the needs of the industry and make contributions efficiently to the United States of America's economic increase and improvement. [8]

The deficiency of employability talents among IT graduates in India presents a significant challenge to the global competitiveness of the Indian IT industry. As the industry experiences rapid growth and garners increasing reputation worldwide, the presence of readily employable professionals becomes paramount for maintaining and augmenting its competitive advantage. The absence of essential employability skills among IT graduates may also result in a misalignment between industry requirements and the skills of graduates, thereby hindering innovation, technological adaptation, and the ability to meet global customer demands effectively. This discrepancy poses a substantial risk to the Indian IT industry's position in the global market and its potential for sustained success and growth. [8]

Moreover, the Indian IT sector's ability to remain competitive internationally hinges on its capacity to furnish skilled professionals capable of driving the development and implementation of cutting-edge technologies. Without the requisite employability skills, IT graduates may find it challenging to contribute effectively, potentially undermining the industry's position in the global market and diminishing opportunities for growth and market share. [8]

The 2007 Employer Survey identified a lack of alignment between engineering graduate attributes and employer needs. Employers rated oral communication, written communication, capacity to learn new skills, capacity for cooperation and teamwork, and interpersonal skills with colleagues and clients as the most important skills for engineering graduates. [9]

Employers also required higher levels of application skills from engineering graduates, which were essential for greater efficiency and to enable improvement and innovation. The survey results showed consistencies in findings from previous research, indicating that engineering university graduates lacked skills required by employers, particularly in communication, problem-solving, leadership, and social ethics skills. [9]

The upward thrust of automation and robotics is reshaping activity possibilities for engineering graduates. As era advances, automatic structures threaten to replace human employees, potentially main to activity losses. Studies suggest that this shift may want to affect a large quantity of jobs, including those for engineering graduates. it's critical for graduates to adapt to the demands of the fourth business revolution (4IR) by using obtaining applicable capabilities early on. Failing to achieve this risks unemployment, making the development of 4IR abilities a top priority for ensuring graduates' employability in the evolving task marketplace. [10]

Engineering firms face specific challenges related to teamwork and communication skills due to the highly specialized and demanding nature of the engineering curriculum. The conventional approach to engineering education focuses primarily on individual effort rather than team collaboration, leaving little room for learning social skills and understanding group dynamics. This results in academically high-achieving graduates who may lack necessary non-technical skills, including effective teamwork and communication abilities. [11]

Additionally, the industry demands more collaboration and team-playing skills from engineers, as firms aim to boost efficiency, meet customer needs with shorter deadlines, and achieve more with limited resources. These challenges require engineers to be good team players, communicators, and social individuals, which may not be adequately addressed in traditional engineering education. [11]

The study focuses on assessing the following specific skills among international engineering Master's students:, Information management skills, including the ability to recognize the importance of exploring background and context, trusting their own reasoning skills, and avoiding over-reliance on tutor guidance and general search engines., Inquisitiveness, organization, and a systematic approach, which involves the ability to analyze large tasks, break them down into smaller parts, design solutions, produce prototypes, and provide justification for the processes chosen., Problem-solving and analytical skills, which encompass applying theory to practice for dealing with complex problems, understanding the background of a problem, analyzing and proposing solutions, and testing and evaluating the success of the solutions. [12]

Important skills for engineering graduates

Information management skills, including information seeking and inquisitiveness

Organization and systematic approach in developing research projects

Problem-solving and analytical skills, such as understanding background, analyzing, proposing solutions, and testing and evaluating success

Open-mindedness, reflexivity, and evaluative skills, including receptive practice and formulating views and opinions

[12]

In today's interconnected world, engineers must possess a diverse set of skills to remain competitive beyond technical proficiency. Understanding the broader context in which engineering functions operate is crucial. Engineers must grasp the interplay between different disciplines such as design and manufacturing to effectively collaborate across organizational boundaries. By spanning engineering discipline boundaries, they can innovate more holistically and contribute to interdisciplinary projects with greater insight and effectiveness. [13]

Cultural awareness and foreign language education are becoming increasingly essential for engineers. In a globalized economy, working with colleagues and clients from different cultural backgrounds is commonplace. Engineers who possess a broad education that includes social sciences, humanities, and proficiency in foreign languages are better equipped to navigate diverse international environments. Cultural sensitivity fosters stronger relationships, facilitates smoother communication, and enables engineers to adapt their solutions to meet the specific needs and preferences of varied markets. [13]

Also, the ability to thrive in diverse international environments is paramount. Engineers need to understand the global context of emerging technology needs and the expanding markets for products and services. This requires not only technical expertise but also a keen understanding of cultural nuances, regulatory frameworks, and market dynamics across different regions. Engineers who can effectively navigate these complexities are better positioned to drive innovation, foster collaboration, and contribute meaningfully to their organizations' global success. [13]

Consequently, we should expect parallel trends in the production and employment of human resources used for that building and manufacturing. In China, it is the rapid development of the economy from a relatively low level that is generating the demand for engineers. Thus, it hardly seems remarkable that in 2008 China felt a need to graduate approximately 660,000 engineers from a population of 1.3 billion people to add to a total workforce of over 780 million. The vast increase in the number of engineers in China is focused on meeting rather basic infrastructure and natural resource needs. It is not indicative of an engineering arms race that threatens the relative U.S. ability to innovate or to compete. [13]

The paper discusses the rapid increase in demand for IT workers at the beginning of the 21st century, partly due to a technology bubble, particularly in the dot-com sector. This sudden increase in demand for IT workers is highlighted as a significant trend in the field of engineering. The paper also mentions a study on the IT industry and skills demands, indicating a focus on the changing landscape of the IT industry and the corresponding skills required. [13]

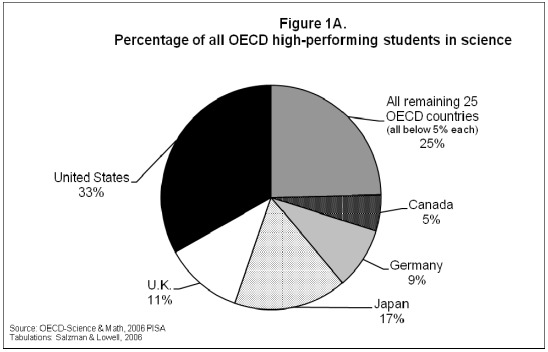
The paper discusses two types of engineers: "transactional" and "dynamic" engineers. Transactional engineers have technical expertise but lack the experience or expertise to apply their knowledge to larger domains. On the other hand, dynamic engineers possess the skills to apply their technical knowledge to larger domains and are considered to be high performers. The paper highlights that there are very few dynamic engineers graduating from Chinese and Indian universities, which impacts the overall quality of engineering graduates in those countries. [13]

The most important 21st-century skill for engineering students to develop is considered to be creativity and innovation. This skill enables students to create new ways of thinking, find solutions to new problems, and innovate to build new products and services, which are essential in the rapidly evolving field of engineering. [14]

The document underscores the need for engineering schooling to equip college students with 21st-century skills and abilities crucial for the worldwide workplace. It advocates for curriculum innovation to provide numerous cultural and social exposure, emphasizing collaborative and interdisciplinary tasks to foster energetic studying and high-stage trouble-fixing abilities. Additionally, it discusses tasks consisting of the "Worldwide Engineering Program," which gives students global getting to know reviews and early studies publicity. The curriculum aims to prepare students for international challenges by way of cultivating talents like innovative trouble-solving, interdisciplinary know-how, cultural competence, and powerful conversation. Moreover, it stresses the importance of engineers being adaptable to ambiguity and various contexts, advocating for planned measures in curriculum design and implementation to ensure a significant educational revel in. [14]

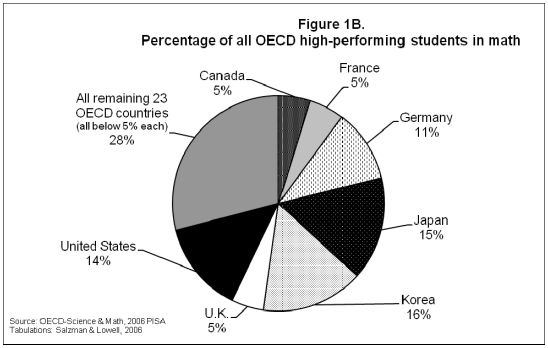
Engineering college students come across numerous challenges, such as a disconnect among their schooling and the expectations of the expert global, insufficient practice for the worldwide workplace, and insufficient emphasis on twenty first-century talents like problem-fixing, collaboration, and communication. To deal with these troubles, it is proposed that engineering education should prioritize the cultivation of 21st-century talents thru planned, centered measures. this will involve restructuring the curriculum to encompass collaborative and interdisciplinary responsibilities, initiatives, and assignments, at the side of implementing active studying techniques. moreover, there is a need to reconsider how crucial skills are defined and how evaluation tasks are formulated, with a focus on empowering college students to develop superior critical thinking, adaptable problem-fixing, collaborative, and verbal exchange abilities essential for fulfillment inside the place of work. [14]

Fostering twenty first-century abilities amongst engineering college students is paramount because of the ever-evolving requirements of the engineering profession. Engineers are increasingly more tasked with creatively tackling global issues, participating in diverse groups, articulating difficult standards, and adapting to swift technological and societal shifts. The significance of honing these capabilities lies in equipping engineers to confront problematic societal troubles, contribute to the welfare of humanity, and excel in globalized and modern work surroundings. furthermore, prioritizing twenty first-century competencies corresponds to the need for engineers to navigate ambiguity, show off humility, and possess interdisciplinary expertise, reflecting present day challenges and expectations inside the engineering area. [14]



**Percentage of all OECD High-Performing students in Science [13]**

Inside the area of technology education, America is broadly identified as an international leader, with an outstanding cohort of high-achieving students whose accomplishments surpass those of other countries. Despite the United States' vast economic and social diversity, its pool of excellent science students remains extraordinary. Over the last three decades, the USA has consistently maintained a significant percentage of top-performing students in the field of science, showcasing exceptional stability and excellence. This sustained performance is further highlighted by the country's growing population, which has led to an increasing number of outstanding science graduates, exceeding the available job opportunities in science and engineering sectors year after year. [13]



**Percentage of all OECD High-Performing students in Math [13]**

Similarly, in the realm of mathematics, the United States demonstrates remarkable proficiency, ranking second only to Japan in producing top-performing math students worldwide. Despite the nation's diverse demographics, its prowess in mathematics remains unparalleled among industrialized countries. Over time, the United States has consistently produced a steady stream of highly skilled math students, bolstering the population of exceptional graduates. While this surplus of mathematical talent underscores the nation's dedication to academic achievement, it also poses a challenge in effectively matching this abundance with available opportunities in the mathematics field and related industries. [13]

# Comparison.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Communication | Problem  Solving | Decision  Making | Teamwork | Planning | Leadership | Flexibility | Integrity | Technical -  Skills | Creativity | Adaptability | Time Management | Organization |
| [1] | ✔ |  |  |  |  | ✔ | ✔ | ✔ | ✔ |  | ✔ |  |  |
| [2] | ✔ |  |  |  | ✔ |  |  |  | ✔ |  |  |  | ✔ |
| [3] | ✔ | ✔ |  | ✔ |  |  | ✔ |  |  | ✔ | ✔ |  | ✔ |
| [4] |  | ✔ |  |  | ✔ | ✔ |  | ✔ | ✔ |  |  | ✔ |  |
| [5] | ✔ |  |  |  | ✔ |  |  |  | ✔ | ✔ |  |  | ✔ |
| [6] | ✔ | ✔ |  | ✔ |  | ✔ |  |  | ✔ |  | ✔ |  |  |
| [7] |  | ✔ |  | ✔ | ✔ |  |  | ✔ |  | ✔ |  | ✔ |  |
| [8] | ✔ | ✔ | ✔ |  |  | ✔ | ✔ |  | ✔ |  | ✔ |  | ✔ |
| [9] | ✔ |  | ✔ |  | ✔ |  | ✔ |  |  | ✔ | ✔ | ✔ |  |
| [10] |  |  | ✔ | ✔ |  | ✔ |  | ✔ |  | ✔ |  |  |  |
| [11] | ✔ |  |  | ✔ |  | ✔ |  | ✔ |  |  | ✔ | ✔ | ✔ |
| [12] | ✔ | ✔ |  |  | ✔ | ✔ |  | ✔ |  |  | ✔ | ✔ |  |
| [13] | ✔ | ✔ |  | ✔ |  | ✔ | ✔ |  | ✔ |  | ✔ |  | ✔ |
| [14] | ✔ |  | ✔ | ✔ |  | ✔ |  |  | ✔ |  | ✔ |  |  |

Based on the comparison table, it is evident that communication skills are consistently emphasized across the referenced papers, appearing most frequently as a skill under evaluation. This trend underscores the universal recognition of communication as a fundamental competency in various contexts. The prominence of communication skills suggests a shared acknowledgment among researchers of its critical role in professional success and effective collaboration.

Conversely, decision-making skills emerge as the least emphasized in the reviewed literature. This finding may suggest either a relative underrepresentation of decision-making in research discussions or a potential area of improvement in professional development strategies. It prompts reflection on the importance of decision-making competence in navigating complex scenarios and highlights a possible gap in the attention afforded to this skill in educational and training programs.

While communication skills dominate the discourse, the comparatively lower emphasis on decision-making skills raises questions about the balance of focus in skill development initiatives. Are we adequately preparing individuals to make informed and timely decisions in diverse environments? This observation underscores the need for a holistic approach to skills development that considers the interplay between various competencies, including communication and decision-making.

# CONCLUSION

In end, the analysis of the referenced papers sheds mild on the multifaceted landscape of employability elements amongst engineering graduates, each in India and at the global stage. The major focus on communique and teamwork capabilities underscores their typical importance in navigating the global task marketplace, emphasizing the vital position of effective interpersonal dynamics and collaborative skills. however, the extraordinarily subdued interest given to choose-making competencies prompts mirrored image on the readiness of engineering graduates to cope with complex challenges in various expert contexts. This remark underscores the importance of equipping graduates with the capacity for important thinking and well timed choice-making to decorate their competitiveness inside the international area. furthermore, the exploration of employability elements extends past technical capabilities, highlighting the developing popularity of broader ability units encompassing adaptability, creativity, and hassle-solving acumen. As engineering roles evolve in response to changing enterprise needs, fostering these holistic ability units will become imperative for ensuring the preparedness of graduates to thrive in a dynamic and interconnected international task marketplace. as a consequence, the findings underscore the want for academic and training packages to undertake a complete method to skill development that addresses the numerous and evolving desires of engineering graduates in each nearby and worldwide context.

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