EMPLOYABILITY SKILLS OF INFORMATION TECHNOLOGY UNIVERSITY GRADUATES IN INDIA

By

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DISSERTATION

Presented to the Swiss School of Business and Management Geneva

In Partial Fulfilment

Of the Requirements

For the Degree

DOCTOR OF BUSINESS ADMINISTRATION

SWISS SCHOOL OF BUSINESS AND MANAGEMENT GENEVA

JUNE 2025

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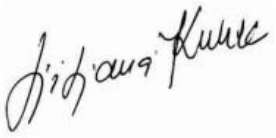
Dr. Ljiljana Kukec 

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DEDICATION

To my parents —

To my mother, Meenu Singhi, whose unwavering love, strength, and guidance have profoundly shaped the person I am today.

And most especially, to my father, Sitaram Singhi — I miss you always.

Your unwavering belief in my potential and your constant encouragement to push beyond my limits continue to inspire me. Though you are no longer by my side, your faith remains a guiding force behind all that I strive to achieve.

ACKNOWLEDGEMENTS

This thesis marks the culmination of a journey made possible by the support, encouragement, and inspiration of many extraordinary individuals.

First and foremost, my husband, Yash Poddar. Your unwavering support—through wise counsel, quiet strength, and your steadfast presence—has been my anchor throughout. Your belief in me has carried me through every challenge and milestone.

To my mentor, Dr. Ivica Katavić, thank you for your invaluable guidance, insight, and belief in my potential. Your patience, generosity, and dedication to nurturing academic curiosity have left a lasting impact. It has been an honour and privilege to learn under your mentorship.

To my siblings—thank you for surrounding me with love, laughter, and unwavering support. In moments of uncertainty, your presence has grounded me and reminded me of the deep strength that family provides.

To my in-laws—thank you for your understanding, and constant encouragement. Your support has meant more than words can express.

To Savita Thakur, thank you for being a trusted confidante and collaborator. Your thoughtful perspectives and our shared conversations enriched this journey, and your encouragement has been a continuous source of strength.

Finally, I extend my gratitude to all those who have walked alongside me—colleagues, co-workers, students, and friends. Whether directly or indirectly, your presence has contributed meaningfully to my growth and success.

From the depths of my heart, thank you all.

ABSTRACT

EMPLOYABILITY SKILLS OF INFORMATION TECHNOLOGY UNIVERSITY GRADUATES IN INDIA

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2025

This dissertation explores the employability skills of Information Technology (IT) graduates in India, focusing on the alignment between academic education and industry requirements. The study aims to ascertain the causes that lead to the inadequacy of academics in effectively bridging the gap between the skills imparted at educational institutions and those required by employers, despite awareness about the issue. The study also examines the perspectives of students, faculty and industry professionals regarding graduate readiness for the industry. Employing a mixed-method approach, the research utilizes qualitative and quantitative data collection techniques, including surveys and interviews to gather insights from various stakeholders. The findings indicate significant technical and soft skills gaps, with students expressing concerns about their lack of hands-on experience and practical application during their educational training. Faculty members reported challenges such as administrative burdens and limited industry engagement, which hinders their ability to align curricula with industry needs. Industry representatives noted that graduates often require extensive retraining, particularly in problem-solving, communication and the latest technologies. Furthermore, a noticeable discrepancy exists between students' self-assessments of their preparedness and the

employers’ assessment. This dissertation emphasises the necessity for the curriculum to be more closely aligned with industry requirements, advocates hybrid learning methods, soft skill trainings, integrating practical learning opportunities such as internships, industry collaborations and hands-on projects. It also highlights the importance of faculty development programs and sustained industry partnerships to maintain the relevance of academic training. It advocates integrating AI, digital tools and entrepreneurial training and utilising CSR funds to support the academia. This dissertation highlights the need for the government initiatives to promote shared accountability among all stakeholders, ensuring that each plays a proactive role in enhancing graduate employability. The study provides valuable recommendations for bridging the gap between academia and industry and thereby enhancing IT graduates' employability in India.

Keywords: Employability, Skill Gap, Information Technology, Graduate, India

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CHAPTER I:

INTRODUCTION

1.1 Introduction

Numerous studies have underscored a growing concern regarding the disparity in skills imparted at educational institutions and the requirements of the industry. Industry continuously emphasizes the importance of skills such as communication, teamwork, problem-solving, adaptability and mutual relations, yet many graduates still lack these skills when entering the workforce. (Komari, 2020, FICCI & NMIMS, n.d.) The proposal underlines a study to identify specific factors contributing to the failure of academia in effectively addressing these gaps, despite awareness about the issue.

Employment is a complex idea that goes beyond having educational qualification or technical knowledge. (Kumar, 2017) It is a combination of knowledge, skills and mindset along with the ability to effectively display and apply these characteristics in practical and real-life scenarios. Apart from gaining employability skills a lot depends on how the person presents them in the job application and interviews.

According to Kumar (2017) “Employment Skills are the transferable abilities that a person needs in order to be considered employable.” Besides strong technical understanding and subject matter expertise, companies often seek additional talents in their employee. (Pitan, 2016) They believe that these abilities will enable the employees to perform their job better.

Employability skills are a set of personal qualities that include cross-functional and general talents that are necessary to land a job and retain it. These capabilities, usually referred to as transferable skills, are not unique to any one industry. Employability skills are abilities needed to land, keep, and thrive in a job (Suleman, 2018; Aggarwal, 2021).

Employers commonly identify a set of ten key employability skills that they seek in potential hires. These include:

- Communication
- Interpersonal Skills
- Technical Skills
- Problem-Solving Skills
- Working Under Pressure and Meeting Deadlines
- Organizational Skills
- Teamwork
- Initiative and Self-Motivation
- Ability to Learn and Adapt
- Negotiation Skills

1.2 Background

The study of employability skills among IT graduates in India is vital due to the increasing skill gap in the IT industry (ISR, 2023), which poses challenges for both graduates and employers. Recent studies emphasize that there is a mismatch between the skills acquired during academic programs and skills required in the industry. This gap has significant impact on career progression and job readiness, particularly in India's swiftly advancing IT sector.

Bridging Skill Gaps for Industry 4.0

According to the Indian Skill Report (2023), “With the swift advancements in technologies, IT professionals are expected to possess not only technical expertise but also essential skills such as adaptability, soft skills, problem-solving and teamwork”. Studies show that graduates lacking these skills struggle to secure employment and meet industry expectations.

By understanding these gaps, institutions can design the curricula to include market-relevant skills, ensuring graduates are more confident and prepared for the workforce.(ISR, 2023)

Aligning Education with Industry Needs

As stated by Awadhiya (2022) “Universities play a critical role in equipping students with employability skills aligned with industry demand and global standards”. To get better results, it has been suggested that "structured industry training and partnerships with employers" be added. "Graduates who have experienced real-world situations during their education" show far higher job prospects. (Awadhiya, 2022)

Contributing to Economic Growth

The IT sector plays a vital role in driving India’s growth, which contributes significantly to GDP and employment. However, lack of skills threatens this development trajectory. Addressing these gaps can lead to better employment rates for graduates, innovation and continuous economic progress (JETIR, 2023). In addition, increasing employment ensures that India's workforces remain competitive in global markets, increasing the country's reputation as a hub for skilled IT professionals.

Promoting Digital Literacy and Future Skills

The Government's initiative like " Pradhan Mantri Kaushal Vikas Yojana" has identified the importance of digital literacy and future-oriented skills for IT professionals (India Briefing, 2023). Studies show that customised employability programs that focus on these skill areas can increase the inclination of graduates to meet the demands of global and local IT markets.

By studying these employment skills among IT graduates; stakeholders such as universities, policy makers and industry leaders, can design targeted strategies to fill the skill

gap, encourage innovation and increase job readiness. This will also contribute to creating a more adaptable and globally competitive IT workforce (ISR, 2023).

1.3 Statement of the Problem

India's abundant human resources represent one of its greatest strengths, yet equipping the graduates with the necessary skills to meet the demands of a “evolving workforce” continues to be a challenge (Padmaja, 2023). Despite the increasing recognition of the importance of employability skills like communication, critical thinking, adaptability, and teamwork — educational institutions fail to prepare students adequately, leaving them unprepared for modern professional environments. This skill gap not only hinders students' ability to secure employment but also hampers the socio-economic development of the country.

The study aims to identify fundamental reasons why educational institutions struggle to develop these essential employability skills within their curriculum. Although institutions and government are taking initiatives aimed at skill-building, their effectiveness remains questionable due to poor alignment with stakeholder expectations and insufficient collaboration. (Cruz, 2024). Employers prioritize competencies such as teamwork, adaptability, and communication; however, academic systems often fall short in including these into formal education. (Tomar, n.d.)

A major concern lies in the lack of alignment between institutional efforts, students’ aspirations and the expectations of employers. (Aggarwal, 2021) This disconnect results in reduced student engagement with career development programs thereby widening the gap between academic outcomes and employment requirements. Without addressing the root causes

of this misalignment, the challenges in creating a workforce-ready population remains unresolved. (Braun et al., 2022) This study focuses on analysing the viewpoint of students, teachers and industry professionals, to identify gaps in the implementation of employability related initiatives.

By examining these alignments, the research aims to find out whether the observed lack of student engagement is due to mismatched goals, poorly designed programs, or systemic issues within academia. Eventually, the findings will provide actionable recommendations to bridge the gap between education and employment, fostering a more collaborative and effective approach to workforce readiness.

1.4 Purpose of the Study

This mixed-method research aims to examine how educational and employability reforms, along with policy interventions, can contribute to empowering IT graduates with skills aligned with employer demands. The study examines the alignment, or lack thereof, between the educational experiences provided by academic institutions and the skill requirements of the modern workforce. (Pal, Bhattacharya & Sarkar, 2023) With India's abundant human resource potential, addressing gaps in employability skills is critical for fostering socio-economic growth. However, significant disparities remain between academic curricula and real-world industry needs. (SGT University, 2023)

This research examines the perceptions of students and freshers how effectively their education prepares them for employment. The purpose of this research is to find out the challenges faced by teachers in the alignment of educational programs to meet the evolving demands of the industry and accordingly impart necessary employability skills.

This study further explores the extent of consensus between students, freshers, and faculty on the key skills and competencies mandatory for favourable results in today's competitive job market. By analysing these points, the study seeks to fill the gaps between academic preparation and the practical skills required for success in one's career. Additionally, it introduces actionable strategies to bridge these gaps effectively.

Based on the theoretical frameworks like Holland's Job-Fit Theory (Holland, 1997), which focuses on the compatibility between individual abilities and job requirements, and other framework like Bloom's Taxonomy (Anderson & Krathwohl, 2001), which provides a structure for designing curriculum that address both practical and cognitive skill development, the study evaluates the interplay of education and employability. (Yorke, 2006) Literature highlights the growing importance of skills like communication, critical thinking, teamwork, and adaptability in enhancing job readiness in the 21st-century workforce.

By addressing these objectives, the purpose of the study is to contribute to discussion in bridging gaps in education and employability (Agava & Litsalia, 2024), providing an insight to direct curriculum reforms, teaching practices, and stakeholder collaborations to improve employability for graduates.

1.5 Research Questions

RQ1. How do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment?

RQ2. What challenges do faculty members identify in aligning the curriculum with evolving industry requirements and in ensuring effective skill delivery?

RQ3. What key skills and competencies needed for successful employment in today's job market are lacking?

RQ4. To what extent do students, freshers, faculty members and industry agree on the key skills and essential competencies for successful employment in today's job market?

RQ5. What gaps are identified in secondary sources between academic preparation and real-world skill expectations for students, recent graduates, and educators?

1.6 Significance of the Study

Although there is reasonable literature about the employability of the young workforce in India, there is a significant gap between the education system (particularly in fostering employability skills like adaptability, problem-solving, and communication) and requirements of the IT industry.

This research is important because it addresses a significant difference between the demand of the Indian education system and the IT industry, especially in promoting necessary employability skills. Although considerable literature exists on employability challenges in India, limited research has directly examined what difficulties higher education institutions face when aligning curricula and teaching methodologies with industry expectations.

In today’s competitive, post-pandemic global economy, graduates are expected to possess a mix of cognitive, non-cognitive, and technical skills to meet evolving workforce demands. By exploring strategies to align the education system with industry needs, this study will benefit multiple stakeholders:

1. For Higher Education Institutions: The findings will provide actionable insights to reform outdated curricula, adopt experiential learning strategies, and integrate industry collaborations to better equip students with job-ready skills.

2. For Students: By identifying skill gaps and proposing targeted solutions, this research will increase students' employability and career prospects, which will empower them to succeed in a dynamic and competitive job market

3. For Industry Stakeholders: The study highlights opportunities for collaboration between academia and industry to foster a workforce that meets real-world IT sector demands.

In addition, this research supports India's goal of taking advantage of its demographic dividend, as young graduates play an important role in driving economic development, innovation and global competition (Pal et al., 2023). By closing the difference between academia and industry, study contributes to both personal success and national development. Finally, it offers a pathway for Indian higher education to effectively produce skilled, adaptable, and future-ready workforce.

1.7 Definition of Key Terms

Adaptability: "Adaptability is a vital skill, that allows individuals to effectively adjust themselves to new environments and challenges." (Martin et al., 2023)

Communication Skills: "Communication skills are an important part for employability, because they enable individuals to effectively communicate ideas, collaborate with teams, and address professional challenges." (Wu, Xu, and Philbin, 2023)

Creativity and Innovation: "Creativity and innovation are important skills for employability as they drive problem-solving ability and adaptability in quickly changing job markets." (Anderson & West, 2020)

Critical Thinking: "Critical thinking is one of the key factors of skill sets for employability, which enables individuals to analyse complex situations, make decisions, and provide efficient solutions for the given problems." (Facione, 2019)

Data Literacy: "Data literacy is an important skill for employability, as it enables professionals with the ability to analyse, interpret, and utilize information in decision-making processes." (Ridsdale et al., 2021)

Digital Literacy: "Digital literacy plays a vital role in employability, providing proficiency in digital tools and critical platforms for contemporary workplaces." (Nguyen et al., 2020)

Educated Unemployment: "The skill mismatch between academic education and market needs leads to educated unemployment." (ILO, 2019)

Emotional Intelligence: "Emotional intelligence (EI) is a basic component of skill to employability, as it increases self-awareness, empathy, emotional regulation and social skills." (Ceschi et al., 2016; Serrat, 2017) In IT graduates, EI nurtures effective teamwork, conflict resolution and adaptability, which are crucial in dynamic tech environments.

Employers' Expectation: The IT industry not only focuses on technical skills to employability but it also requires soft skills, like problem-solving, leadership and communication. (Pathak, Shankar & Tewari, 2018)

Employability Obstacles: Employability obstacles faced by most IT graduates students include mismatch of skill alignment with industry, insufficient focus on soft skills and limited industry exposure. The academic curriculum often fails in addressing real-world challenges and leaving graduates half-baked for workplace demands. (Pathak, Shankar & Tewari, 2018)

Employability Skills: Employability encompasses the knowledge, skills and attributes that make a person effective in securing and excelling in jobs. (Crosta et al; 2023)

Economic and Political Instability: In India, the employability of IT graduates gets affected significantly due to the economic and political instability, disrupting the labour market and limiting job growth. (Dutta, 2018)

Government Policies: Government policies like "Skill India" aims to bridge the employability gap by promoting technical and job-related education for IT graduates. (Padmaja, 2023)

HEI (Higher Education Institutes): Indian Higher Education Institutes (HEIs) play a vital role in shaping the career of IT graduates, yet they often fall behind in addressing the industry demands.(Tsao, 2017)

India's Skilling Ecosystem: India's skilling ecosystem is evolving to address the significant employability gap, particularly in the IT and technology-driven sectors. Government policies like "Pradhan Mantri Kaushal Vikas Yojana (PMKVY)" and the establishment of Industrial Training Institutes (ITIs) have expanded access to vocational training and digital skills. (ISR, 2023)

Hands-on Experience: A lack of practical learning in academic programs is a significant barrier. (Pandey, 2019) IT graduates often lack exposure to practical scenarios, which are crucial for roles involving coding, system design, and troubleshooting.

Lack of Guidance and Industry Exposure: "Limited career counselling and inadequate interaction with industry professionals leave graduates unprepared for the job market." (Shah, 2021)

Leadership: “Leadership is a critical employability skill for IT university graduates as it fosters collaboration, innovation, and the ability to manage complex projects.” (QS, 2018; García-Álvarez et al.; 2022)

Limited Resources: Limited resources, such as budget constraints and lack of industry-standard tools, challenge universities in equipping IT graduates with the latest skills. (García-Álvarez et al., 2022; QS, 2018)

NEP, National Education Policy: The National Education Policy (NEP) emphasizes a flexible, multidisciplinary approach to education, aiming to bridge the gap between academic programs and industry requirements. (García-Álvarez et al., 2022; QS, 2018)

Rapidly Evolving Technology: The fast pace of technological advancements creates a demand for graduates who can quickly adapt to new tools and methodologies. (García-Álvarez et al., 2022; QS, 2018)

Rigidity of Academic Programs: The rigidity of traditional academic programs often hinders graduates from acquiring skills that match industry expectations. (García-Álvarez et al., 2022; QS, 2018)

Soft Skills: Soft skills like communication, teamwork, leadership and problem-solving, are crucial skill sets for career success. (Crosta et al; 2023) These skills play a vital role in bridging the gaps between academic learning and professional requirements.

Sustainable Development Goals: The Sustainable development goals play a pivotal role in aligning higher education to industry priorities, (Brookings Institution, 2019; UNESCO, 2023) including employability skills for IT graduates.

Talent-Driven Economy: A talent-driven economy focuses on developing human capital as the primary driver of innovation and growth, especially in technology-based sectors. (UNO, 2018–2023)

Teamwork: Teamwork is an essential skill for success in the corporate field and is highly valued by employers. It helps individuals collaborate effectively in diverse and multidisciplinary environments, ensuring better results through collective effort. (Brookings Institution, 2019; UNESCO, 2023)

Work-Integrated Learning (WIL): Work-Integrated Learning (WIL) connects academic learning with practical experience, (Brookings Institution, 2019) making it essential for improving the employability of IT graduates.

1.8 Summary

The research seek to investigate into the employability skills of Information Technology (IT) graduates in India, addressing the significant gap between academic learning and industry demands. The purpose of this study is to identify key employability skills, evaluate the current gaps, and propose strategies to enhance graduate's preparedness for the job market. The research plan involves surveying employers, faculties and IT graduates to gather data on skill expectations and discrepancies. The key terms include skill gap, Industry-Academia collaboration, employability skills and practical training. This study is important to align educational outcomes with the demand of the industry, which can result in improved employment and in turn contribute to India's economic growth.

CHAPTER II:

REVIEW OF LITERATURE

2.1 Introduction

This literature review attempts to analyse the diverse reasons for educated unemployment in India in a holistic manner. The review is framed in such a way that it focuses on the key parameters of the issue. The first segment clarifies the sources for the research and the research methodology used to gather pertinent studies. The second section explains the ideological structure, where the concept of employment skills, their relevance in real -time situations and their short comings in the Indian employment market are discussed. The third section clarifies India's labour policies and how they affect employment opportunities and labour power participation. The fourth segment clarifies the employer's expectations from the candidates and the skill deficiencies that lead to an erroneous match between the educational degrees awarded and industry demands.

This review addresses the main reasons for educated unemployment in India. Review identifies potential solutions, such as modernization of educational programs to match market demands, promoting greater interactions between industries and institutions, and developing more efficient policy guidelines. This analysis helps in understanding the issue and selecting efficient action to improve the employment rate. (Faridi, 2021; Pandey, 2021; Zala et al., 2023)

OECD (2019) and Bessen (2020) reports assert, human capital development as a response to challenges from automation. Evidence shows that training prior to employment is most effective. But in India, unemployment and underemployment are widespread, and most graduates are overqualified for their jobs. Institutions fail to align educational outcomes with employer expectations, as Wheebox (2020) highlights a significant disparity between industry needs and

university offerings. Employers often resort to providing job-specific training, incurring costs to compensate for insufficient skill education at the university level.

Studies by Awadhya and Kanjilal (2019) and Calonge and Shah (2016) underscore the need for customized skill-based curricula in Indian universities to foster workforce readiness. According to Yorke (2006) and recent findings from the India Skills Report (2022), creativity, social intelligence, and other 21st-century skills are increasingly sought after. These skills, which differentiates humans from machines, remain low in traditional education systems. The report also highlighted the lack of institutional guidance in developing overall, skill-based education approaches.

Laura and Maria (2018) emphasize the lack of an educational structure that integrates competency development through active teaching-learning strategies. They recognize the current system's focus on knowledge assessment over skill acquisition as a major contributor to skill gaps. Patacsil et al. (2014) suggest mandatory internships to expose graduates to real world environments, though this approach faces challenges due to limited internship opportunities.

Gandhi (2014) and Lee (2011) stress the importance of academia-industry collaboration to share expertise and experiences, fostering better employment outcomes for graduates. Mohammad (2016) argues for faculty upskilling through industry projects to ensure alignment with workforce requirements.

Though recent studies indicate the need for including skill-based and competency-based education, not much research seems to have been done on the methods by which it could be introduced in universities. This research aims to throw light on strategies for imparting skills along with domain knowledge and an assessment system to indicate the progress of the skill metrics.

2.2 Inclusion criteria / Documentation

Literature search was conducted systematically to ensure the broad coverage of the subject. Peer-reviewed articles, reports and studies were drawn from prestigious databases such as Academia, Research Gate, HackScience Education, Scholarly, ScienceDirect and ProQuest. Additionally, institutional libraries, journals, conferences and government reports were referred to provide various views. Publications from 2012 to 2024 were referred to, to ensure data and analysis were relevant to current times.

Key terms and phrases were employed to retrieve relevant literature, including "educated unemployment in India," "employability skills theory", "labour market policies", "skill gaps", “employee expectation”, “employer expectations”, “IT in India”, “Academia and Industry” and "unemployment". Boolean operators were utilized to combine keywords and expand the search scope (e.g., "educated unemployment AND India").

In addition, subject-specific words were used to optimize the search, incorporating relevant theoretical studies and empirical data. Studies investigating global trends in education and employment were also reviewed to refer to the Indian landscape within a broad international structure. This study resulted in a well-rounded dataset, leading to a nuanced understanding of challenges and potential interventions to address educated unemployment in India.

Table 2.1 Summary of Nature and source of Resources

Author	Nature of reference	Source
Ackerman (2022)	Technology in Schools	*HackScience Education*
Awadhiya (2022)	Employability Skill Gaps	*Industrial Engineering Journal*
Chakravarty (2024)	Employment crisis: Jobless growth, threat of automation, and impact of climate change on productivity	*The Hindu Frontline*
Coetzee, Ferreira, and Potgieter (2019)	Employer requirements and self-confidence of the employees	*African Journal of Career Development*
Dall, Larsen, and Madsen (2024)	Employer Engagement at the Street Level	*Aalborg University*
Dixit, Tiwari, Gupta, Singh and Gupta (2011)	Educated Unemployed	*International Conference on Sustainable Manufacturing*
Dutta (2022)	Employability Skill Gap	*Quest Journals*
Faridi (2021)	Educated Unemployment	*Sunrise Publication.*

Gethe and Hulage (2020)	Current Employability	*International Journal of Advances in Management and Economics*
Gupta, and Meher (2020)	Causes of Unemployment and Underemployment among Educated Mass	*Journal of Xi'an University of Architecture & Technology*
Kumari (2024)	Skill Development Program	*International Journal of Research and Review.*
Kumar, Gupta, Singh, Bhattacharjee, Chakraborty, Datta, Sharma, and Vyas (2020)	Skilled Unemployment	*Journal of Engineering and Technology Management*
Packianathan and Narayanan (2014)	Employability Skills	*International Journal of Management (IJM)*
Pandey (2021)	Problem of Unemployment - Causes and Remedies.	*International Journal for Modern Trends in Science and Technology*
Pulgam (2023)	Indian Start-Ups	*Journal of the Maharaja Sayajirao University of Baroda.*
Singh and Chingakham (2024)	Use of ICT in Schools in AP	*Alochna Journal*

Srivastava, Mehta, and Dhote (2023)	Inequality of Opportunity	*The Indian Journal of Labour Economics. Springer India*
The report does not specify a single author but is a collaborative effort by Wheebox, Tagged, Confederation of Indian Industry (CII), and other partners.	Post-COVID Talent Demand and Supply	*India Skills Report 2021*
The report does not specify a single author but is a collaborative effort by Wheebox, Tagged, Confederation of Indian Industry (CII), and other partners.	Roadmap to India's Skills & Talent Economy by 2030	*Indian Skill Report 2023*
Ünlüer (2024)	Theory of Mind Skills and Peer Relationships	*Frontiers in Psychology*
Zala, Thakkar, Zala, and Makwana (2023)	Unemployment	*Conference: Unemployment Analysis - Review Paper At:*

Indus University, Ahmedabad,

Gujarat, India

India's educated unemployment rate, has been increased after Covid -19 pandemic and resulted in high level of stress among unemployed graduates. Systemic issues have been exposed due to pandemic, underlining the need for major adjustments. The findings show that novel technologies, globally linked methods, and more government support is required to address this issue. Two proposed solutions include fostering globally standardized employment initiatives and enhancing government support through targeted educational funding and strategic policy reforms. In order to address the root cause and come up with sustainable solutions it is necessary to have a comprehensive, multi-faceted approach—integrating government intervention, technological advancements, and alignment with global standards (Faridi, 2021).

Despite India being the largest democracy in the world and its economy expanding quickly, unemployment is still a major problem (Ackerman, 2022). This has been a long-standing issue, for which the government has now begun self-employment and credit-linked programs to encourage entrepreneurship. The purpose of these programs is to offer funding and facilitate business endeavours. However, their ability to address the root causes of unemployment is limited. Additional strategic actions that combine the target interventions with the support of the government are necessary for guaranteed sustained employment. For inclusive development and economic stability, this strategy is necessary to deal with unemployment holistically and boosting India's economic expansion (Pandey, 2021).

“Indian unemployment is a persistent issue in spite of initiatives of the government in the form of skill development, entrepreneurship promotion, and promotion of foreign capital.” (Zala

et al., 2023) Job generation has been slower than population growth, laying bare the inadequacy of existing measures and creating serious social and economic implications. The problem highlights the need for a more integrated approach to create durable employment for the growing industry. While the existing measures are largely, they are not enough to meet the complexity of the problem of unemployment. An integrated approach, combining government policies with innovative and inclusive steps, is necessary to improve employment opportunities, synchronize workforce skills with market needs, and create long-term economic viability. To address unemployment effectively, coordination and planning in multiple sectors are needed (Zala et al., 2023).

"The research introduces a new method to evaluate inequality of opportunity (IOp) in India based on Roemer's (1998) equality of opportunity approach. Machine learning methodologies—conditional inference trees and forests for ex-ante IOp and a transformation tree for ex-post IOp—were applied in the analysis. The results suggest that conditions are responsible for 58–61% of the income gap and effort contributes 46%. Occupation of the parent, the urban–rural gap, and interregional inequality are the primary forces of IOp, and socially underprivileged rural eastern and central Indian communities and the low-skilled group specifically face the highest intensities of inequality. The analysis suggests region-level interventions as urgent to mitigate income disparities and achieve equity" (Srivastava, Mehta and Dhote, 2023).

Unemployment and underemployment have been persistent challenges in post-independence India, where a labour-surplus, agrarian economy and low capital have led to low industrial productivity and a largely unprofitable, monsoon-dependent agricultural sector. Key job market indicators include the labour force participation rate (LFPR)—the percentage of the working-age population employed or seeking work—and the unemployment rate, representing

those actively seeking but lacking employment. However, these broad metrics are often imprecise, with definitional ambiguities that can obscure underemployment and disguised unemployment, potentially presenting a more favourable picture of national employment levels than reality (Chakravarty, 2024).

The report by Gupta et al.(2020) investigated the reasons behind unemployment and underemployment among educated in India, especially in Katihar district, Bihar. Despite economic development, India struggles with employment generation, especially for educated youth, due to factors such as lack of industry alignment and inadequate practical skills. The study uses primary data from 500 students to identify these issues, aiming to inform educational and policy changes that could improve employment prospects (Gupta et al., 2020).

The report by Gethe and Hulage (2020) investigates employment issues faced by Indian graduates, especially in engineering and MBA areas, highlighting the difference between the needs of the industry and the skills of graduates. Despite having a degree, many graduates lack the skills required for jobs, leading to high unemployment rate. Employers seek candidates with both technical skills and soft skills such as communication, problem-solving, and adaptability (Gethe and Hulage, 2020).

The study suggests that the curricula must focus more on practical skill development and encourages entrepreneurship to motivate graduates to be job creators rather than job seekers. (Dixit, Tiwari, Singh and Gupta, 2011).

The report identifies causes such as an education system that focuses on theory over practical skills, leading to a preference for 'white-collar jobs.' It emphasizes the need for vocational training and educational reform to align skills with market demands. Additionally, it

explores types of unemployment and the negative impacts on the economy due to an underutilized workforce (Kumar et al., 2011).

Dutta explores the "employability skill gap" in India, examining the mismatch between the skills fresh graduates possess and those expected by employers. Using a stratified sampling survey of 200 recruiters across 12 industrial sectors, the research identifies significant deficiencies in key areas, including technical knowledge, practical training, and soft skills such as communication and teamwork. To address these gaps, the study suggests partnership between academia and industry to co-create curriculum, integrate practical training and enhance learning experience instead of rote recollection. These measures aim to better align the capabilities of graduates with industry requirements thereby increasing employment (Dutta, 2022).

The purpose of Packianathan's study is to "develop an ideological structure for employment skills required for business graduates", drawing on a literature review spread from 1994 to 2013. Major findings highlight the importance of aligning the course with industry needs, analysing important skills such as communication, analytical thinking, leadership and critical thinking. The research proposes that graduates require a specific set of employability skills and that curricular changes can effectively enhance these abilities. The framework is designed to help graduates self-assess and improve their competencies, while also encouraging educational institutions to update their curricula to better prepare students for the job market" (Packianathan and Narayanan, 2014).

"The India Skills Report (2023) examines the strategic overview of India's skills and talent economy by 2030, highlighting employability trends and industry forecasts. The report includes outcomes of the Wheebox National Employability Test (WNET), showing a significant improvement in employability rates among young Indians, with 50.03% being highly

employable.” Key findings emphasize the increasing role of digital literacy, gender involvement in the workforce, and the impact of private and public skilling initiatives on employability. The report aims to provide insights into talent supply and demand, preparing India's workforce for future industry needs and technological advancements (Wheebox and CII, 2023).

Skilled unemployment in the IT sector in India originates from a mismatch between educational training and industry needs, churning out graduates without practical skills. Rapid technological changes require continuous upskilling and many professionals fail to achieve, this leads to their skills being obsolete. The dependency on offshore projects and outsourcing has reduced innovation in the local market. The lack of innovation and R&D in the Indian IT sector limits job opportunities for skilled professionals (Kumar et al., 2020).

Awadhiya (2022) identifies important employability skill gaps between IT graduates and skills required by employers. The study emphasizes the need for higher education institutions to interact with the industry regularly to update curricula and technology. The study found that 85.4% of employers acknowledge the existence of these gaps and call for more industry-academia collaboration to bridge them. The research suggests adopting innovative practices in education to better prepare graduates for the job market (Awadhiya, 2022).

The report by Ackerman (2022) explores the integration of technology in schools, emphasizing the development from print to digital media. It highlights the roles of IT in teaching, learning, data management and operations within educational institutions. The author discusses the challenges IT professionals face when transitioning to the educational environment and the need for collaboration between educators and IT specialists. The aim is to bridge the gap between these two groups to improve the effectiveness of technology in education (Ackerman, 2022).

The India Skills Report (2021) investigated, “The impact of the COVID-19 pandemic on the talent landscape in India, analysing both talent demand and supply.” The report highlights the shift to remote work and technology adoption and talks about how the skill gap widened in the workforce. The report combines assessments of 65,000 candidates and surveys from 150+ corporates, providing insights into the readiness of the talent pool for new-age jobs. It aims to guide stakeholders in addressing the evolving demands of the job market post-pandemic (ISR, 2021).

Unluer(2024) investigates the relationship between “Theory of Mind (ToM)” skills, peer relationships, and school adjustment in preschool children. It finds that children's age, ToM skills, and peer relationships significantly predict their school adjustment. The study highlights the importance of ToM and social interactions in early childhood education. Findings suggest that fostering these skills can improve children's adaptation to preschool (Unluer, 2024).

“India, with over 1.2 billion people, has a growing working-age population, potentially providing a demographic advantage.” (Kumari, 2024). However, unemployment threatens this ability due to skill gap. The study examines the implementation of the National Skill Development Policy, focusing on rural India, using Saran district in Bihar as a case study. Findings show a mismatch between training centre outputs and industrial needs, particularly in IT, highlighting the need for diversified and industry-aligned training programs (Kumari, 2024).

The study examines how employers emphasize graduate’s personality traits and self-confidence in securing employment. It identifies marketability, entrepreneurial orientation, and networking/job search orientation as key mindsets that enhance self-confidence. The research finds that higher levels of these mindsets positively influence graduates' intrinsic and extrinsic self-confidence in gaining employment. The study contributes to employability literature by

emphasizing the importance of these mindsets alongside traditional skills and qualifications (Coetzee, Ferreira and Potgieter, 2019).

In recent years, employer engagement in employment and social services has gained attention, focusing on how it can provide disadvantaged unemployed individuals with relevant training and employment opportunities. While much of the literature addresses employer willingness and corporate social responsibility (CSR), less attention is given to the micro-processes of engagement. This study examines the day-to-day efforts of Danish public employment services to engage employers in supporting vulnerable groups, highlighting how this engagement involves all organizational levels and strengthens the employability of disadvantaged individuals (Dall, Larsen and Madsen, 2023).

The study investigates the development opportunities and challenges faced by the Indian Start-ups, which highlights government initiatives such as “Startup India” and “Digital India”. It notes that despite significant support, about 90% of Indian start -ups failed within the first five years, due to the impact of the unsustainable business models and the Covid -19 epidemic. The paper emphasizes the role of internet penetration, investor ecosystem, and corporate partnerships in fostering start-up growth. The researcher provides recommendations for better utilization of opportunities and overcoming challenges in the Indian start-up ecosystem (Mangesh, 2023).

Studies were conducted in schools situated in Namsai, Arunachal Pradesh to investigate the integration and impact of information and communication technology (ICT). It highlighted the benefits of ICT in increasing educational quality and learning experience. “Research provides insight into current usage, challenges and potential solutions for effective ICT implementation.” (Singh, 2024). Findings suggest that proper training for teachers and adequate infrastructure are crucial for maximizing the benefits of ICT.

2.3 Theoretical framework

Introduction

A Theoretical framework is the underlying base of any research. It helps in viewing, analysing, and understanding the problem. It has theories, concepts, and models that are supportive of the research. It ensures that the research is based on existing practice and knowledge. The theoretical framework is important as it connects the theories of employability with the practical aspects of skill development in the IT industry. Employability skills consist of different segments that are affected by such factors as industry need, pedagogy of teaching, and social-economic determinants. All these need a strong theoretical base to act as a guiding mechanism for the research (Lederman, 2015).

Theory of Reasoned Action

The **Theory of Reasoned Action (TRA)**, introduced by Martin Fishbein and Icek Ajzen in 1975, explain the relationship between attitudes, intentions, and behaviour. TRA is widely used in order to predict and understand how people make decisions in different situations. It explains that a one’s intention to behave in a particular way depends on their attitude towards their behaviour and external pressure. Attitudes determine if a person thinks that performing a behaviour is good or bad, while subjective norms determine the degree to which a person is under social pressure to carry out that behaviour. TRA suggests that a person's intentions are the strongest predictors of what they actually do, assuming they can control the situation. (Martin et al., 2023).

Theory of Employability Skills

"The **Theory of Employability** focuses on understanding the factors that influence an individual's ability to gain, maintain, and develop in employment. It is built on the idea that employability is not just about having the right qualifications, but also about possessing a range of skills, attributes, and behaviours that are necessary to succeed in the job market." (Pool and Sewell, 2007) This theory often emphasizes both individual and structural factors that contribute to employability, including educational background, personal qualities, and external market conditions.

The Career Ecosystem Theory

The Career Ecosystem Theory (Baruch & Rousseau, 2019) considers dynamic interactions between people, organizations, and social elements that jointly affect career development and advancement. This viewpoint highlights that professions are moulded by interactions within a larger ecosystem that includes a variety of actors and environmental factors rather than being formed in a vacuum. Important elements of this hypothesis consist of:

- **Actor:** Individuals, organizations, educational institutions and social institutions that directly or indirectly affect career development.
- **Interaction:** Relationship and exchange between these actors, such as mentorship, networking and organizational support
- **Environmental Conditions**: Economic trends, technology shifts, cultural trends, and policy frameworks that impact career opportunities and trajectories.

With this systemic approach, the “Career Ecosystem Theory” provides a comprehensive insight into how various factors and stakeholders shape career paths with regard to the importance of adaptability and continuous learning in response to the evolving nature of work.

The Conceptual Framework of Employability

The Conceptual Framework of Employability is a theoretical model that outlines the key dimensions and factors contributing to an individual's employability. It provides a comprehensive approach to understanding what makes a person employable, and how they can develop the necessary attributes and skills to succeed in the labour market. One widely referenced model is the framework, which emphasizes a combination of personal, social, and cognitive factors (Fugate et al, 2004).

The Conceptual Framework of Employability highlights key dimensions influencing employability: career identity, which involves self-awareness of career goals and values to guide skill development; personal adaptability, critical for managing workplace changes and learning new skills; and social and human capital, where networks, relationships, education, and experience play pivotal roles in job success. Additionally, organizational fit ensures alignment with company culture, enhancing satisfaction and performance (Yorke, 2006).

The Consensus theory

Consensus Theory is a sociological perspective that emphasizes the importance of common norms, values, and beliefs in preserving social order. According to this theory, society runs efficiently when everyone in it agrees on what is acceptable and unacceptable. According to

this view, by fostering shared values and standards, social institutions like religion, education, and the law are essential in fostering consensus.

Consensus Theory emphasizes societal cohesion through shared values and norms that promote social order and stability. Social institutions, such as schools, play an important role in fostering these values, promoting conformity and reducing conflict (Durkheim, 1893). Finely aligned with functionalism, theory sees social components as contribution to overall harmony. However, it faces criticism for ignoring social inequalities and power dynamics, particularly how dominant groups may impose their values, leading to marginalization and conflict.

Conflict Theory

The struggle theory is a sociological structure that emphasizes the “role of power struggles”, “inequality and competition” in shaping social structures and relationships. Based on the writing of Carl Marx, it sees society as a battlefield in which the parties with different resources and objectives strive for power and domination. Conflict theory emphasizes the splits and conflicts brought about by economic, social, and political inequality, in contrast to consensus theories that place an emphasis on harmony and agreed values (Marx and Engels, 1848).

Human Capital Theory

Human Capital Theory is highly relevant to the topic "Employability Skills of Information Technology University Graduates in India" because it emphasizes the “role of education, skills, and experience in enhancing an individual’s productivity and economic value.” In the context of IT graduates in India, the theory can be used to explore how investments in

education, training, and skill development impact employability in a rapidly evolving technological landscape (Becker, 1964).

Human Capital Theory views education and training as investments that enhance individual productivity, leading to higher earnings and contributing to economic growth. It suggests diminishing returns, where additional education yields progressively smaller productivity gains. It can be applied to “Workforce Development”, “Organizational Training” and “Economic Policy”.

Human capital theory can explain why individuals pursue higher education, expecting better career opportunities and higher salaries. Similarly, a government might invest in STEM education to build a workforce capable of supporting a knowledge-driven economy.

Holland’s Job-Fit Theory

Holland’s Job-Fit Theory, also known as Holland’s Theory of Career Choice, was developed by psychologist John L. Holland. It proposes that individuals are more satisfied and productive in their work when there is a good match between their personality types and the characteristics of their work environment. The theory is built on the idea that people search for environments that align with their personal interests, skills, and values.

Holland's “RIASEC” model categorizes six personality types — “Realistic”, “Investigative”, “Artistic”, “Social”, “Enterprising”, and “Conventional” — each aligned with specific work environments. Job satisfaction and performance improve when personality and work environment align (congruence). The Holland Code, a combination of three types, helps individuals identify careers that match their strengths, preferences, and long-term goals.

Holland's Job Fit Theory has several practical applications. In career counselling, it aids individuals in identifying career paths that align with their personality traits, ensuring a better fit and satisfaction in their professional choices. For organizations, it works as a guide to design jobs aligned with employee preferences and strengths, thus increasing productivity and job satisfaction. Additionally, in education and training, theory supports aligning educational programs with personality types of students, promoting more engagement and improving learning results.

Bloom's Taxonomy

Bloom's Taxonomy is a framework for categorizing educational goals, originally developed in 1956 by Benjamin Bloom and collaborators. It is widely used to design curriculum, assess learning outcomes, and guide instructional strategies. The taxonomy classifies learning objectives into three domains: "Cognitive", "Affective" and "Psychomotor".

1. Cognitive Domain (Knowledge-Based Learning)

The "Cognitive Domain" in Bloom's Taxonomy (1956) outlines six levels of intellectual skills: "Knowledge" (recall facts), "Comprehension" (understand and explain), "Application" (apply knowledge), "Analysis" (break down components), "Synthesis "(create new structures), and "Evaluation" (make judgments). Each level builds on the previous, developing progressively advanced learning and critical thinking skills.

2. Affective Domain (Attitude-Based Learning)

The Affective Domain focuses on emotions, values, and attitudes, progressing through "Receiving" (awareness), "Responding" (active participation), "Valuing" (commitment),

“Organizing” (integrating values), and “Characterizing” (consistent behaviour), accentuating emotional and value-based learning and growth.

3. Psychomotor Domain (Skills-Based Learning)

The Psychomotor Domain focuses on physical skills and coordination, progressing through “Perception” (sensory awareness), “Set” (readiness), “Guided Response” (practice), “Mechanism” (proficiency), “Complex Overt Response” (skilful execution), “Adaptation” (modifying skills), and “Origination” (creating new movements), emphasizing proficiency through practice and application.

Bloom's taxonomy has various applications in education. This helps teachers to create learning objectives that targets appropriate cognitive levels. In evaluation, it guides the development of tests and assignments that align with desired learning results. Additionally, it indicates direct strategies, ensuring teaching methods for learning at different levels. Educators can achieve comprehensive learning and encourage high-order thinking among students by integrating Bloom's Taxonomy.

Hillage and Pollard’s Model of Employability

This model defines employability as “the ability to gain, maintain, and progress within employment.” The framework has four key components. “Employability” assets encompass the skills, knowledge, and attitudes that graduates possess. “Deployment” refers to their ability to effectively apply these skills in the job market. “Presentation” focuses on how graduates show themselves, such as CVS and interview. “Personal circumstances”, including factors such as family support, location and economic background, also play an important role in shaping employment.

2.4 Theme/ Subtopic

Employment Skills Theory

The term IT industry is associated with the discipline Information Technology or referred to as the IT Sector has been growing at a fast pace in India. With a huge number of IT graduates entering the job market every year, the information technology (IT) sector of India is one of the major sectors for the economic growth of the country. For Indian IT graduates to become employed and be job market competitive, employability skills are very important. The major employment traits for IT graduates are technical skills, good communication, teamwork and problem-solving skills, flexibility, and leadership. In order to make their graduates industry-ready with the skills required by the industry, Indian IT institutes need to incorporate employability skills training into their curriculum (Aggarwal, 2021).

Employability and Related Terms

- **Employability Skills:** Employability skills are skills for which an organization hires workers who effectively get their work done. Some of them are technical competence, good communication, team work, problem-solving skills, flexibility, and leadership. Indian IT graduates' biggest employment barrier has been their absence of employability skills.
- **Technical Skills:** Technical skills, crucial for Indian IT graduates were one of the key reasons for IT graduate unemployment. To remain competitive in the labour market, Prakash highlighted the need to be familiar with new technology (Prakash et al., 2018).

- **Communication Skills:** Communication skills become highly important for Indian IT graduates to deal with clients, colleagues, and superiors. The employers in the IT sector themselves ranked communication skills as highly on their agendas. Mukhopadhyay's survey revealed that IT universities would have to incorporate courses on communication skills as a part of their course curriculum (Mukhopadhyay et al., 2017).
- **Teamwork and Problem-Solving:** Problem-solving and teamwork are essential for Indian IT graduates to work and to address complex technical issues. According to Srivastava and Nandan (2019) study, "employers placed high emphasis on problem-solving and cooperation abilities." The study also found that IT colleges must give students the chance "to collaborate with others and find solutions to real-world issues."
- **Adaptability:** Adaptability is necessary for IT graduates in India due to the dynamic nature of work. Kumar and Udaya Kumar (2018) confirmed in their research that "adaptability is an important employability attribute." Research also highlighted the "importance of lifelong learning" to ensure flexibility and competition in the labour market.
- **Leadership:** One of the most important employability skills for IT students in India to handle teams, projects, and customers is leadership. Lata and Gupta (2018) carried out research in which they found that "the employers in the IT industry valued leadership skills the most." The research further recommended that the IT universities incorporate leadership training into their curriculum.

Skills supply and demand for the labour market

The report by Ministry of Skill Development and Entrepreneurship highlights that government initiatives aimed at expanding access to education and training can positively affect labour market and that tackling the issue of educated unemployment is essential for India's long-term economic growth and development (Ministry of Skill Development and Entrepreneurship, 2021). Serious problems like educated unemployment and underemployment are plaguing India's educated youth. The cause of educated unemployment is a discrepancy between graduates' goals and the jobs that are open to them.

Skills Required for Employability

In order to be employable, graduates of IT universities are required to have a mix of technical and non-technical abilities. Study found that technological skills including web development, database administration, software engineering, programming languages, and data analytics are necessary for employability (Rani, Usha and Viswanatha, 2017). Communication, teamwork, problem-solving, leadership, and flexibility are examples of non-technical talents. The study also found that in order for IT graduates to stay employable, they must be able to learn new things and keep up with the latest developments in their field.

Employer Requirements And Employment Mindset

Employers worldwide are having trouble locating graduates with the necessary employability skills, and India faces a similar problem (Awadhiya, 2020). The considerable disparity between graduates' employability skills and industry norms has unsettled employers (Patwardhan, 2019; Wheebox, 2020).

It appears that education's current state lacks the recognized objective of improving society and individuals. “We don't think it's vital to ask people why they need education because we're in a hurry to have everyone educated.” (Patwardhan, 2019) The thirst for "white collar jobs" among educated youth is the cause of unemployment.

Opportunities and Challenges in the IT industry

India has seen a significant increase in the Information Technology (IT) sector, which has increased the requirement of IT experts. One of the most important sectors for India's economic development is the IT sector, where a large number of graduates become a part of the workforce annually. Still, there is a discrepancy between the abilities that IT graduates possess and those that the business demands. The purpose of this study of the literature is to investigate the present knowledge of employability skills among Indian graduates of IT universities.

Elements that Affect Employability

The employability of Indian IT university graduates is influenced by a number of factors. Internships, industry-academia cooperation and soft skills training are important elements that affect IT graduates' employability. Employers emphasize practical skills and work experience, which may be obtained through industry projects and internships. (Raju and Rao, 2018).

Furthermore, a 2019 study emphasized the necessity for IT graduates to have industry-specific skills, such as familiarity with industry norms and procedures and awareness of emerging technologies. The study also found that IT graduates are more employable if they had earned industry certifications or participated in training programs related to the field (Venkatesh and Kumar, 2019).

The Graduate Competency Gap

Other factors that contribute to unemployment include a lack of educational opportunities and resources for career counselling. The world is experiencing a fierce struggle for survival. After completing their schooling, young individuals have a very hard time finding a job that suits them. For the majority of young people, selecting a career is solely motivated by the desire to make money. Their failure in life stems from this inclination. They do not choose a profession for which they are qualified or skilled. Therefore, it is important to offer both educational and career guidance to the youth. This will help them select a career that aligns with their skills and abilities. Additionally, it will help resolve the issue of unemployment (NSDC, 2019).

Government Support

The government have taken several steps

- The skill development programs aim to give people vocational training so they can acquire the abilities that employers need.
- Programs for start-ups and entrepreneurship gives people money and other assistance to launch their enterprises, which in turn generates employment prospects.
- Promoting industry-academia cooperation. The goal of this partnership is to give students real-world training experiences and the skills that employers are looking for.
- The Digital India program was put into place by the Indian government with the goal of giving people all around the nation access to digital infrastructure and

services. The digital economy has expanded and job possibilities have been created in the sector as a result of this program.

Youth Unemployment

Youth unemployment in India is among the major concerns and is one of the most discussed issues. In addition to emphasizing the positive correlation between employability and skills, knowledge, attitude, and competencies, the ISR report identified five key elements that are essential for learning and acquiring new skills. (ISR, 2023). These elements highlight how abilities can greatly improve employability prospects.

The Wheebox India Skills Report, 2023 offers vital information about the supply and demand for talent as well as recruiting intentions throughout India. It was created in partnership with CII, Tagged, AICTE, AIU, Sunstone, Pearson, AWS, and The Economic Times. The goal of 2023 study is to develop employment skills and competencies for upcoming years by producing informative data that captures the realities of the labour market today. In order to ensure strategies to efficiently locate, retain, and upskill talent, ISR(2023) by Wheebox uses advanced standardized exams for pre-hiring and learning requirements.

Through the "National Career Service" offered at "Model Career Centres" around the nation, the Ministry of Labour and Employment empowers applicants. In order to promote sustainable growth in Indian industry, the Confederation of Indian Industry (CII), which was founded in 1895, works with corporations, governments, and civil society organizations. With more than 9000 members from the public and commercial sectors, including SMEs and multinational corporations, CII plays a vital role in the development of the country in a number

of areas, including healthcare, education, diversity and inclusion, and skill development. (Confederation of Indian Industry (CII), 2019)

The employment landscape in India and throughout the world is changing dramatically as businesses embrace digital technologies in response to scientific and technical breakthroughs. In order to prepare India for a talent-driven economy by 2030, the research highlights the necessity of proficiency in tech-related, computational, technical, and administrative domains. The India Skills Report's knowledge partner, Tagged, offers both quantitative and qualitative information on the employment and hiring environment, illuminating market trends and industry demands.

The research emphasizes how crucial it is to prepare India's youth for the workforce in the coming ten years by making them highly employable professionals. For Indian talent to be positioned as a major force in the upcoming years, gender participation in the workforce and more internship opportunities are essential. The success of comprehensive commercial and public skilling initiatives has resulted in the increase in employability for the youth, indicating the need for private-public sector cooperation in determining skill needs and developing future skills. Evolving job markets demands competencies beyond traditional skills thereby making the employability of IT graduates a critical concern. “Key skills such as digital literacy, data literacy, critical thinking, emotional intelligence, and creativity are now essential for success in dynamic workplaces.” (Suleman, 2018; Awadhiya, 2020) Despite government initiatives like those led by the National Skill Development Corporation (NSDC), higher education institutions (HEIs) often prioritize theoretical knowledge over practical skill-building. This disconnect leaves graduates underprepared for industry demands, contributing to underemployment despite strong economic growth and rising demand for skilled talent in sectors such as IT, BFSI, and e-commerce (Gethe and Hulage, 2020; ISR, 2020).

To solve these challenges, a change is necessary towards a skill-based education model. HEIs must integrate practical competencies in its curriculum, install matrix to track skill development, and promote upskilling and reskilling opportunities for students. Coordination between academics and industry is important to ensure that graduates have the necessary skills for emerging roles and technological progress (Raju and Rao, 2018; Kumar, 2017). By aligning education with the needs of the workforce, India can better prepare its youth population to meet the expectations of the employer, maintain economic growth and secure a competitive status in the global economy.

Importance of Employability Skills

Employability skills profoundly impact the long-term career success and employability of IT graduates in India. These skills go beyond academic qualifications and technical expertise; they include personal attributes and soft skills, such as communication, teamwork, adaptability, and problem-solving, which are essential for securing and retaining employment. According to Kumar (2017), employability is a multidimensional concept that blends knowledge with the ability to apply that knowledge in real-world scenarios effectively. For IT graduates in India, demonstrating these skills is crucial in standing out in competitive job market.

Employability skills shape a graduate's ability to work effectively in diverse environments, collaborate with teams, and handle job-related challenges. Suleman (2018) and Aggarwal (2021) emphasize that these transferable skills are indispensable for career success, particularly in the fast-paced and ever-evolving IT industry. Graduates with strong communication and interpersonal skills, for instance, can quickly adapt to workplace dynamics and contribute positively to organizational goals. Awadhiya (2022) points out that when

universities integrate employability skills into their curricula, students are better prepared for the workforce, improving their chances of career progression and long-term employability.

Employers in India further underline the need for such skills, consistently highlighting the gap between academic education and industry requirements. Pitan (2016) notes that while technical expertise is necessary, the lack of essential soft skills often hampers IT graduates' ability to perform well in interviews and integrate into workplace environments. Consequently, IT graduates who develop technical along with soft skills are more likely to secure and sustain employment, advancing their careers over the long term.

Skill-Based Education and Employment

Skill-based education is critical in reducing unemployment rates among IT graduates. As the demand for highly skilled professionals in India's IT sector increases, graduates with the right combination of technical and employability skills are better equipped to meet industry expectations. The growing skill gap between academic qualifications and the skills required by employers has led to higher levels of unemployment among graduates. According to the India Skills Report (ISR, 2023), the inability of educational institutions to align their curricula with the rapidly changing demands of the IT industry contributes significantly to the unemployment problem.

Recent studies have indicated that skill-based education directly correlates with improved job readiness and reduced unemployment. ISR (2023) highlights that IT graduates who possess coding, problem-solving, and digital literacy skills, alongside soft skills such as adaptability and teamwork, are much more employable. Awadhiya (2022) notes that industry-academia partnerships, which incorporate hands-on experience, internships, and exposure to real-world

scenarios, can significantly reduce unemployment rates by better-preparing students for the workforce.

Moreover, government initiatives such as the “Pradhan Mantri Kaushal Vikas Yojana” have been pivotal in bridging the skills gap by offering skill development programs targeting the IT sector. These programs are designed to provide students with the specific skills employers require, thereby improving their chances of employment. Padmaja (2023) affirms that by shifting from traditional knowledge-based education to skill-oriented training, the Indian education system can better align itself with the needs of the IT industry, reducing the unemployment rate among IT graduates.

Employability Skills and Innovation

Employability skills are essential in driving innovation and enhancing competitiveness within the IT sector. In today’s rapidly changing technological landscape, IT companies seek professionals who can apply technical knowledge, innovate, and adapt to new challenges. As technologies such as AI, IoT, and blockchain evolve, the demand for creative problem-solving, critical thinking, and adaptability in IT graduates is more significant than ever. Awadhiya (2022) argues that IT graduates with these employability skills are better equipped to contribute to innovation, thereby fostering competitiveness within the sector.

Employability skills, particularly creativity and teamwork, are directly linked to innovation. Suleman (2018) emphasizes that professionals collaborating with others, thinking critically, and approaching problems creatively are more likely to drive technological advancements and develop solutions that enhance business operations. Rani & Viswanatha (2017) further reinforce this by stating that working in diverse teams and strong communication

skills allows IT professionals to share knowledge, collaborate on innovative projects, and contribute to developing cutting-edge products and services.

IT professionals who can adapt quickly and lead during technological disruption, are needed due to the increasing integration of digital technologies into business operations. Graduates with high adaptability and emotional intelligence are more effective at responding to industry changes and can help companies maintain a competitive edge. Kumar (2017) highlights that IT professionals who continuously upgrade their skills and can apply their knowledge in real-world situations are more likely to thrive in the competitive IT industry, contributing to the growth and success of their organizations.

In summary, employability skills are crucial for individual career success and play a pivotal role in fostering innovation and ensuring the continued competitiveness of the IT sector in India. ISR (2023) suggests that graduates equipped with these skills are more likely to meet the industry's dynamic needs, driving both technological advancement and organizational growth.

Strengths of Current Educational System

The current educational system in India offers several strengths that support the preparation of IT graduates for the workforce, particularly regarding technical knowledge and access to higher education. One of the most significant strengths is the widespread availability of technical education across many institutions, with over 900 engineering colleges in India, providing a substantial number of IT graduates each year (AICTE, 2024). This provides a robust foundation for the growth of India’s IT workforce. Furthermore, focusing on theoretical

knowledge and technical competencies, equips graduates with the essential skills to understand complex IT concepts and systems.

India's educational system also fosters increasing industry-academia collaborations, which have significantly improved in recent years. Awadhiya (2022) highlights that such collaborations provide students with valuable opportunities to work with industry experts, gain real-world exposure, and enhance their job readiness. These partnerships often include internships, industry visits, and guest lectures from industry professionals, which help bridge the gap between theoretical knowledge and practical application. Additionally, the government's initiatives such as the "Pradhan Mantri Kaushal Vikas Yojana" aim to upskill students, especially in digital literacy and future-oriented skills (India Briefing, 2023), further contributing to the readiness of IT graduates.

Moreover, technical institutes and universities in India are increasingly incorporating updated curricula in response to the global demand for IT professionals skilled in emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), and 5G (ISR, 2023). These programs prepare students to meet the industry's rapidly evolving demands. Kumar (2017) also notes that the intense focus on STEM (Science, Technology, Engineering, and Mathematics) disciplines contributes to producing a technically competent workforce, vital for the country's economic growth.

Curriculum Shortcomings

Despite these strengths, the current curriculum in IT education in India often falls short in preparing graduates with the comprehensive employability skills needed for success in the workforce. One of the key limitations is that the curriculum's focus remains heavily tilted

towards technical skills, often at the expense of soft skills such as communication, teamwork, adaptability, and leadership. Pathak et al. (2018) argue that employers frequently report a lack of these soft skills among IT graduates. This gap significantly impacts graduates' ability to perform well in interviews and integrate effectively into workplace environments.

Another major shortcoming of the current system is the insufficient emphasis on practical, hands-on experience. Awadhiya (2022) points out that many educational programs do not adequately incorporate industry exposure or real-world problem-solving scenarios into their curricula. As a result, students may excel in theoretical understanding but struggle to apply their knowledge in practical situations, which is a key requirement in the IT industry. Moreover, the lack of structured internships or industry collaboration programs means that many graduates are unprepared for the challenges they will face once they enter the workforce. Kumar et al. (2020) emphasize that the lack of practical experience makes it difficult for graduates to meet industry expectations, contributing to a high rate of underemployment and unemployment.

The curriculum is also rigid and slow to adapt to emerging technologies and industry trends. As the IT sector evolves rapidly, the educational system often fails to keep pace with these changes, leaving graduates with outdated skills. ISR (2023) highlights that while new technologies like AI and blockchain are shaping the future of the IT industry, many educational institutions are still focused on traditional programming languages and systems. This mismatch between academic learning and industry needs makes it challenging for graduates to compete in the job market.

Challenges in Skill Integration

Incorporating soft skills and practical industry exposure into the IT curriculum presents several challenges for educational institutions in India. One of the primary challenges is the profoundly entrenched focus on theoretical education, which often takes precedence over practical training. As Kumar (2017) noted, the rigid academic structure prioritizes content delivery through lectures and examinations, leaving limited time for interactive, hands-on learning opportunities. This creates a gap between what students are taught in the classroom and the skills required in the workplace.

Another significant challenge is the resistance to change within educational institutions. Many universities and technical institutes slowly revise their curricula to include soft skills training and practical industry exposure. Cruz et al. (2024) argues that “institutional inertia, compounded by outdated teaching methodologies and lack of resources, hinders the integration of these essential components into the curriculum”. Furthermore, faculty members with limited industry experience may not be equipped to teach or emphasize these skills effectively (Braun et al., 2022). Without exposure to industry trends and practices, it is difficult for students to acquire the skills necessary to thrive in the workplace.

Moreover, educational institutions face logistical and financial constraints when incorporating internships, industry collaborations, and practical training programs. Tomar (n.d.) explains that universities often lack the resources and infrastructure to build strong relationships with industry partners, limiting students' opportunities for hands-on experience. Even when such programs exist, they are often not mandatory, and many students may not take advantage of these opportunities due to a lack of awareness or motivation.

Additionally, the rapid pace of technological change poses a significant challenge. As emerging technologies reshape the IT industry, educational institutions must constantly update their curricula to remain relevant. ISR (2023) emphasizes that this is particularly difficult for inadequately funded institutions, who lack access to the latest tools and technologies. In such an environment, it becomes challenging for educators to teach students the skills they need to succeed in the evolving IT landscape.

In conclusion, while the Indian educational system has made strides in preparing IT graduates with technical knowledge, it faces significant challenges in equipping students with the employability skills needed to succeed in today's job market. These challenges include a lack of focus on soft skills, limited practical exposure, resistance to curriculum change, and resource constraints. Addressing these gaps will require a concerted effort from educational institutions, industry leaders, and policymakers to ensure that IT graduates are technically proficient and well-rounded professionals capable of thriving in a competitive global workforce.

2.5 Challenges in Bridging the Skills Gap

The skill gap between academic institutions and industry requirements for IT graduates in India is primarily driven by several interrelated factors, including outdated curricula, lack of practical experience, and rapid technological advancements. One of the most significant factors contributing to this gap is the traditional focus of academic institutions on theoretical learning rather than practical, real-world applications. Kumar (2017) notes that while technical knowledge is crucial, it is insufficient to meet the demands of the IT industry, which requires graduates capable of applying their skills in dynamic and fast-changing environments.

The rapid evolution of technology also exacerbates the gap. New fields like Artificial Intelligence (AI), the Internet of Things (IoT), and Blockchain are growing exponentially, and companies demand that their employees possess skills in these emerging technologies. However, ISR (2023) highlights that many academic programs still focus on older technologies and programming languages, which leaves graduates ill-prepared for the demands of the modern job market. Consequently, IT graduates often find themselves under-skilled for current industry needs, as their education has not kept pace with industry trends.

Furthermore, Awadhiya (2022) discusses the mismatch between the soft skills required by employers, such as communication, teamwork, and problem-solving, and the skills that academic institutions typically emphasize. This lack of focus on employability skills, combined with an emphasis on technical proficiency, exacerbates the skill gap and makes it harder for graduates to meet industry expectations. Employers in India often complain about graduates' inability to effectively communicate within teams or solve complex problems, which are essential skills in the IT sector (Pathak et al., 2018). These factors collectively contribute to the skill gap, affecting IT graduates' immediate employability and long-term career success.

Impact of Educational Inertia

Resistance to change within educational institutions and outdated curricula are significant barriers to aligning education with the evolving IT industry needs. One of the core challenges is the entrenched nature of traditional academic structures and teaching methods. Educational institutions in India often face challenges in updating their curricula to reflect the latest industry trends. Cruz et al. (2024) argue that many universities are reluctant to integrate emerging technologies and teaching methodologies due to institutional inertia, limited resources, and a lack

of faculty expertise in newer fields. As a result, the curricula fail to reflect the rapidly evolving demands of the IT sector.

Awadhiya (2022) highlights that while industry-academia collaborations have increased in recent years, they are still insufficient to drive systemic change in educational institutions. These collaborations are often sporadic, and their impact on the curriculum is minimal. This lack of integration means that graduates continue to receive training in outdated programming languages and technologies, which are no longer in high demand in the industry. This misalignment between education and industry needs, leaves IT graduates underprepared to enter the workforce, as they lack the cutting-edge skills employers require.

Moreover, the rigid structure of educational programs often restricts the inclusion of soft skills training, which is crucial for the success of IT professionals in today's collaborative, cross-functional work environments. Pathak et al. (2018) emphasize that employers prioritize soft skills such as communication, leadership, and teamwork, but these are rarely adequately addressed within the existing educational framework. The failure to update curricula in response to these shifts in industry expectations limits the employability of graduates. It hinders their ability to adapt to the dynamic demands of the IT sector.

Lack of Industry Exposure

The lack of real-world industry exposure and internships is a critical contributor to the skills gap among IT graduates in India. While theoretical knowledge forms the foundation of IT education, the application of this knowledge in real-world scenarios is equally essential for developing employability skills. Awadhiya (2022) argues that the absence of industry exposure limits the ability of students to understand the complexities and practicalities of working in the

IT sector. Without real-world experience, students are often underprepared for the challenges they will face in the workplace, such as managing deadlines, working in teams, and solving industry-specific problems.

Internships and industry collaborations allow students to apply their theoretical knowledge to practical tasks, giving them valuable hands-on experience that employers highly value. However, Kumar (2017) highlights that many Indian universities and technical institutes fail to offer sufficient internships or industry engagement opportunities. This lack of practical experience leaves graduates with gaps in their skill sets, particularly in project management, client interactions, and teamwork. ISR (2023) also underscores the importance of internships in bridging the skills gap, noting that graduates with industry experience are more likely to be hired and succeed.

Additionally, Cruz et al. (2024) argue that the lack of internships and industry exposure limits the development of soft skills, such as communication and problem-solving, which are crucial for success in the IT industry. These skills are often best developed in real-world settings, where students can interact with industry professionals, collaborate on projects, and solve practical problems. The absence of such opportunities in many academic programs means that graduates enter the job market without the interpersonal and practical skills needed to succeed.

In conclusion, the lack of real-world industry exposure and internships significantly contributes to the skills gap among IT graduates in India. The absence of these opportunities hinders the development of technical and soft skills, leaving graduates underprepared for the demands of the IT industry. To bridge this gap, educational institutions must prioritize industry engagement, integrate practical learning into curricula, and increase opportunities for internships and hands-on experience.

2.5 Stakeholders Involved in Bridging the Gap

Role of Educational Institutions

Educational institutions in India play a pivotal role in shaping the employability of IT graduates. They are responsible for providing the IT industry's foundational knowledge and technical skills. However, despite the large number of engineering colleges and technical institutes in India, there remains a significant gap between the skills students acquire during their education and those required by employers in the IT sector. Awadhiya (2022) emphasizes that the existing curricula are often outdated, with many institutions focusing primarily on theoretical knowledge, leaving little room for practical skills development. As a result, graduates are well-versed in academic concepts but lack the hands-on experience and soft skills necessary to succeed in the workplace.

To improve employability, educational institutions must adapt curricula to meet industry demands. This requires updating course content to reflect the latest technological advancements and industry practices, as highlighted by ISR (2023). Furthermore, institutions should focus on integrating practical learning experiences, such as lab work, case studies, and projects that simulate real-world challenges. According to Pathak et al. (2018), soft skills such as communication, teamwork, and problem-solving are crucial for success in the workplace. Hence, curricula should include training in these areas to better prepare students for the challenges of the modern job market. Educational institutions should also foster industry collaborations that enable students to gain exposure to real-world scenarios through internships, industry projects, and guest lectures from professionals in the field. Such initiatives would enhance students' technical

abilities and improve their ability to navigate workplace environments effectively, bridging the gap between education and employment.

Employer Expectations and Collaboration

Employers in the IT sector are increasingly seeking graduates with a blend of technical and soft skills. According to Awadhiya (2022), graduates are expected to have proficiency in networking and programming languages like Python, Java, and C++, as well as in modern technologies such as machine learning, artificial intelligence (AI), cybersecurity and big data analysis. These technical capabilities are essential for IT professionals to contribute effectively to developing and maintaining technological systems in the industry. However, technical expertise alone is not enough. Employers also require graduates to have strong problem-solving abilities, communication skills, and the capacity to work collaboratively in teams. Pathak et al. (2018) highlight that while technical skills are essential, soft skills such as adaptability, communication, and leadership are equally crucial for career progression in the IT sector.

Employers can collaborate with educational institutions in several ways to bridge the gap between industry needs and academic outcomes. First, employers can contribute to curriculum development by providing insights into the skills and competencies they value most. Kumar (2017) emphasizes that industry input is essential for ensuring academic programs align with real-world requirements. Additionally, employers can offer students internships, industry-sponsored projects, and mentorship programs, allowing them to gain practical experience and develop industry-specific skills. Cruz et al. (2024) suggest that such collaborations would help students build the skills necessary to meet employers' expectations while enhancing their employability prospects. Furthermore, employers can participate in faculty development

programs, assisting educators to stay up-to-date with industry trends and teaching practices, ultimately benefiting students.

Furthermore, Suleman (2018) highlights that interpersonal skills, emotional intelligence, and leadership potential are crucial for career growth within the IT industry. Graduates who can work well under pressure, manage conflict, and effectively lead teams are considered more valuable assets to companies. As the industry continues to evolve, the expectation for IT graduates is shifting towards a comprehensive skill set that integrates technical expertise and the ability to function effectively in a collaborative, often global, environment.

Impact of Government Policies

Government policies such as "Skill India" and "Make in India" have significantly improved the skill development of IT graduates in India. The "Skill India" initiative, launched by the Government of India, aims to train millions of youths in industry-relevant skills to enhance their employability. ISR (2023) highlights that this program has contributed to creating a more skilled workforce, focusing on equipping young people with the technical and soft skills needed to succeed in the IT industry. The initiative also emphasizes the need for upskilling and reskilling, particularly in the face of rapidly changing technologies, ensuring graduates remain competitive in the global job market.

In addition to skill development, the "Make in India" campaign has encouraged the growth of manufacturing and technology-driven industries in India, increasing the demand for skilled IT professionals. The government's push to develop a self-reliant and innovative ecosystem has created numerous job opportunities in IT, electronics, and digital infrastructure sectors. Kumar et al. (2020) suggest that the "Make in India" initiative has led to new companies

and start-ups, which require a pool of skilled IT graduates to support their growth. This has, in turn, created a more dynamic and competitive job market for graduates.

Both initiatives have also helped to foster greater collaboration between the government, educational institutions, and industry stakeholders. Pal et al. (2023) argue that these policies have provided a framework for aligning educational programs with industry needs, ensuring that IT graduates possess high-demand skills. Moreover, they have helped raise awareness among educational institutions about the importance of industry-relevant training and the need to update curricula continuously to reflect evolving market requirements.

However, challenges remain, particularly in ensuring that the benefits of these initiatives reach all regions and sectors and that the quality of training matches industry expectations. Pathak et al. (2018) stress the importance of effectively implementing and monitoring these policies to ensure that they achieve their intended outcomes. Nevertheless, the government's focus on skill development and job creation through initiatives like "Skill India" and "Make in India" is undoubtedly positively contributing to bridging the skills gap and improving the employability of IT graduates in India.

Impact of Emerging Technologies

Emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and 5G are transforming India's IT landscape and significantly altering IT professionals' skill requirements. As ISR (2023) notes, the IT industry is increasingly adopting these advanced technologies, and the demand for professionals with specialized skills in these areas is growing. AI, for instance, requires expertise in machine learning algorithms, neural networks, and data science and an understanding of how to implement AI solutions in real-world business contexts. Awadhiya (2022) highlights that graduate must have technical knowledge in these areas and the

ability to innovate and apply these technologies to solve business problems, which is crucial for enhancing competitive advantage.

The rise of IoT has also led to a surge in demand for professionals who understand how to build and manage interconnected systems of devices. Graduates with knowledge in embedded systems, sensor networks, and cloud computing are highly sought after. Similarly, the widespread adoption of 5G technology drives the need for IT professionals who understand the intricacies of high-speed networking, edge computing, and low-latency systems. These technologies are reshaping industries across the globe, and graduates must be equipped with both technical skills and an understanding of the potential business implications of these advancements.

Moreover, Kumar (2017) stresses the importance of a continuous learning mindset among IT professionals as the pace of technological change accelerates. Professionals must not only master current technologies but also be prepared to adapt quickly to new and emerging tools and methodologies. This ability to learn and innovate is critical for long-term career success in the rapidly evolving IT sector.

Employer View on Soft Skills

Employers in the IT industry increasingly recognize that technical skills, while essential, are not the only factors that contribute to a graduate's success in the workplace. Pathak et al. (2018) and Awadhiya (2022) argue that communication, teamwork, and problem-solving skills are among the most highly valued attributes when recruiting IT graduates. These soft skills are integral to ensuring that graduates can work effectively within teams, communicate complex ideas clearly, and resolve challenges that arise in fast-paced, often high-pressure work environments.

Communication skills are critical as IT professionals must explain complex technical concepts to non-technical stakeholders. Kumar et al. (2020) point out that IT professionals who can effectively communicate with clients, team members, and management are more likely to succeed in delivering projects that meet client expectations and organizational goals. Furthermore, writing clear documentation, making presentations, and participating in discussions are crucial for IT graduates to thrive in professional environments.

Teamwork is equally essential in the collaborative nature of modern IT projects. As the IT sector increasingly adopts agile methodologies and works on cross-functional teams, employers seek graduates who can collaborate effectively with colleagues from diverse backgrounds and expertise. Suleman (2018) suggests that working in teams and contributing positively to group dynamics is essential for both short-term project success and long-term career growth within organizations.

Problem-solving skills are a core competency for IT professionals, who are frequently tasked with identifying and resolving technical issues. Employers value graduates who can think critically and find innovative solutions to challenges, especially when dealing with complex systems or new technologies. Kumar (2017) emphasizes that graduates who can quickly assess situations, identify root causes, and apply logical reasoning to develop solutions are more likely to be successful in the IT industry.

In summary, employers increasingly emphasize soft skills like communication, teamwork, and problem-solving in their recruitment processes, recognizing that these skills are essential for ensuring that IT graduates can effectively contribute to their organizations. These skills and technical expertise form the foundation for career success in the competitive IT job market.

2.6 Summary

Employment of IT graduates in India has become a matter of important concern as the job market develops and demands competencies beyond traditional technical skills. Major skills such as digital literacy, data literacy, critical thinking, emotional intelligence and creativity are now necessary for success in dynamic workplaces (Suleman, 2018; Awadhiya, 2020; ISR, 2020). Despite government initiatives like those led by the National Skill Development Corporation (NSDC), Higher Education Institutions (HEIs) often prioritize theoretical knowledge over practical skill-building. This disconnect leaves graduates underprepared for industry demands, contributing to underemployment despite strong economic growth and rising demand for skilled talent in sectors such as IT, BFSI, and e-commerce (Gethe and Hulage, 2020; Wheebox, 2020).

To solve these challenges, a change is necessary towards a skill-based education model. HEI must integrate practical competencies in its course, install matrix to track skill development, and promote upskilling and reskilling opportunities for students. Coordination between academics and industry is important to ensure that graduates have the necessary skills for emerging roles and technological progress (Raju and Rao, 2018; Kumar, 2017). By aligning education with the needs of the workforce, India can better prepare its youth population to meet the expectations of the employer, maintain economic growth and secure a competitive status in the global economy.

CHAPTER III:

METHODOLOGY

3.1 Introduction

A significant problem with Information Technology (IT) graduates in India concerns the lack of skills necessary to meet the demands of the IT industry. Based on this problem, this study emphasized the comprehensive description, in particular how educational and employability reforms, alongside policy interventions, can contribute to equipping IT university graduates with skills aligned with employer demands in India. The study is guided by the following research questions:

RQ1. How do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment?

RQ2. What challenges do faculty members identify in aligning the curriculum with evolving industry requirements and in ensuring effective skill delivery?

RQ3. What key skills and competencies needed for successful employment in today's job market are lacking?

RQ4. To what extent do students, freshers, faculty members and industry agree on the key skills and essential competencies for successful employment in today's job market?

RQ5. What gaps are identified in secondary sources between academic preparation and real-world skill expectations for students, recent graduates, and educators?

This chapter explains the Research Method and Design, the Population and the Sample, how the data was collected, processed and analysed, along with the limitations and ethical assurance.

3.2 Research Methods and Design(s)

The research design for this study focused on investigating how academia and industry are interlinked, emphasizing on job readiness. To achieve this, the study adopted a mixed-method approach, which combined both quantitative and qualitative methods to gather holistic insight from the major stakeholders within the education-employment ecosystem.

This study adopted a qualitative and quantitative exploratory case study approach to investigate skill gaps and strategies for improving 21st-century employability skills. The methodology used multiple data sources to enhance the credibility and reliability of the findings, including content analysis, direct observations and interviews.

In the qualitative study, educators and course coordinators from diverse universities and colleges provided perspectives on curriculum design, pedagogical approaches and the alignment of educational outcomes with industry expectations. The diversity of perspectives and contributions led to recommendations applicable across various educational contexts, enhancing the study's effectiveness and relevance.

In the quantitative study, a survey was conducted for industry professionals and students pursuing the Post Graduate Diploma from Centre for Development of Advanced Computing - Advanced Computing Training Schools (CDAC-ACTS) to gain their motivations, perceptions and identifying issues that may not have been taken into account, as they are the ones most impacted. The content analysis further validated the findings from the primary data collected from the interviews and surveys. It validated and strengthened the credibility by integrating insights from different resources.

This broad inclusion of participants ensures a complete understanding of the challenges and opportunities in workplace preparedness, developing a balanced exploration of both

academic and industry viewpoints. Research design thus enabled a strong examination to better align educational practices with business requirements, supporting the development of actionable solutions to increase employability and productivity in the workforce.

3.3 Population and Sample

Population

The target population for this study includes students, educators, course coordinators, fresh graduates, and employers in the region of Maharashtra, India. It represents key stakeholders in the education-employment ecosystem. For the quantitative study, the participants comprised of students pursuing their Post Graduate Diploma from Centre for Development of Advanced Computing - Advanced Computing Training School (CDAC-ACTS) after completing their engineering degrees at various institutions. Every year, 140000+ students graduate from engineering colleges in Maharashtra (AICTE, 2024).

All participants in this study are engineering graduates from different engineering colleges who, after completing their degrees, enrolled in a skill-based Post Graduate Diploma course with CDAC-ACTS due to challenges faced in securing employment. These students are crucial to the study as they represent the transition phase from academia to the workforce, where skill acquisition is critical. They are directly experiencing the skill gap, which has motivated them to enrol in the course. Every year, more than 8000 students pursue Post Graduation at CDAC in the state of Maharashtra, India.

Additionally, for quantitative data a survey of employees and employers addressed the skills requirements and offered valuable insights for reducing the difference between academics and industry.

For the qualitative study, the participants included faculty, course coordinators and Heads of Departments from diverse universities and colleges across Maharashtra, which has a total of 675 Engineering Universities (AICTE, 2024). Their insights provided diverse perspectives on curriculum and pedagogy capturing unique institutional and regional contexts. This data was gathered through semi-structured interviews. Faculty, Course coordinators and Heads of Departments often have deep insights into both the challenges and innovations in curriculum implementation, providing nuanced and detailed information. As key stakeholders in curriculum development, course coordinators brought expertise that enhanced the credibility and depth of the findings.

This inclusion reflects the interdependent relationship between the three domains and ensures the comprehensive understanding of the essential skills for employability.

Sample

The sample size for quantitative studies includes 304 engineering graduates from various engineering colleges. For the quantitative study for industry perspective, the sample size includes 47 participants. This limited number of participants allows for a more intensive and comprehensive analysis of the collected data. By maintaining a managed sample size, the study ensures better accuracy in identifying patterns or trends.

The chosen sample represents a diverse group of individuals who have recently transitioned from undergraduate to postgraduate diploma studies to gain different skills, providing insights into their preparedness for the workforce. Additionally, this sample size aligns with the study's objective of achieving meaningful results without compromising the depth of analysis, ensuring that the findings are reliable, actionable, and reflective of the broader population.

For the qualitative study, there are eight course coordinators/educators/faculties from different universities, providing diverse perspectives on curriculum and pedagogy and capturing unique institutional and regional contexts. Participation was based on confirmed written consent. The sample allowed to identify resemblances and differences in universities, providing a vast understanding of broader trends and localized practices. Shared experiences and practical suggestions from the respondents helped identify course adjustments, teaching techniques and student training programs to increase employment readiness.

The course coordinators/educators/faculties provided real-world approaches that aligned findings with industry needs. Combining viewpoints from graduates and employers facilitated the identification of discrepancies between educational outcomes and job market requirements and helped develop targeted solutions. This balanced representation ensured that the study captured all the ends of the scope of education-employment, making its conclusions relevant and actionable.

3.4 Data Collection, Processing, and Analysis

Data Collection

For this study, the researcher employed three main data collection techniques: (a) surveys (b) semi-structured interviews and (c) content analysis of secondary data. These techniques were chosen to capture both quantitative and qualitative dimensions of the research. Survey provided average data on the attitude and trends of the stakeholders, allowing interviews for in depth exploration of specific challenges and strategies, and content analysis gave relevant depth by integrating insight from existing literature and reports. Together, these methods complemented each other and ensured a well-rounded and wide understanding of the research problem. Primary

data was collected through questionnaire distributed to various stakeholders, including students, new graduates, recruiters and employers. This helped identify the most in-demand skills for employability, understand the reasons behind the skill gaps and develop strategies to bridge them.

Partially structured interviews were conducted, in addition to surveys. This study followed the four phases of participant recruitment outlined by Berger et al. (2009), helping ensure that the selected participants could offer meaningful and varied insights into skill gaps and what the industry expects from graduates. By following these structured steps, the study enhanced the reliability of its data collection process and ensured the inclusion of voices crucial for addressing the research problem. These included generating initial contacts (i.e., activities to identify potential participants), screening (determining whether or not potential participants are eligible for study participation), consenting (informing potential participant about the study, including its risks and benefits), and enrolment/retention (enrolling eligible participants and retaining them in the study).

This specific participant were chosen to provide multi-dimensional approach: recently employed graduates provided insight into the current educational practices and the challenges faced in the initial days at the workplace, while the industry's employers contributed to the understanding of comprehensive market expectations and skill demands. Course Coordinators explained the different approaches tried and difficulty in implementing some of the solutions.

Their combined perspectives enhanced the validity of the questions by ensuring they are relevant, practical, and aligned with the real-world requirements. Finally, the systematic content analysis provided additional insights into skill development, as well as generated new knowledge about employability skills and challenges in implementing them. Patterns were identified in

content analysis, along with important themes within relevant data sources. A deeper understanding of the evolving demands in the job market was gained by analysing the various skill frameworks.

By using these methods, the study ensured a comprehensive approach to gathering data. Surveys provided quantitative insights into trends and relationships, interviews delved into qualitative interpretations of stakeholder expectations and challenges, and content analysis integrated contextual insights from secondary data. This multi-method approach enabled the study to address the research questions from multiple angles, ensuring a deeper and more holistic understanding of the skill gap and its underlying factors and how to overcome them. Exploratory research, characterized by its flexible structure, allowed effective information acquisition even in areas with limited prior data.

Processing

This research employed a structured approach to analyse teaching methodology, identify structural gaps and explore innovative strategies and address the gaps between education and employment. The data processing approach emphasized alignment of education with literacy and skill needs, promoting employability through application-based learning. In this context, applications-based learning refers to a point of view that integrates theoretical knowledge with practical, problem resolution in real life scenarios. This includes activities such as project-based assignments, internships and case study analysis, which help students develop job-relevant skills and prepare them to effectively meet the expectations of the industry.

Major processes included checking employment trends, evaluating educational reforms and assessing the effectiveness of modern education models in equipping students for industry demands. By integrating these elements, the study identified actionable solutions to bridge the

education-employment gap, provided a foundation for practical reforms and ensured that educational practices prepare students for evolving IT industry.

Analysis

The data collected through surveys has been statistically analysed and presented, while data collected from semi-structured interviews and content analysis underwent a systematic, classified process of data coding and identifying themes/ patterns. The purpose of the analysis was to highlight trends, identify skill gaps and propose actionable strategies to bridge these gaps.

Survey data was analysed using descriptive statistics to summarize central tendencies such as mean and median. Findings were presented through detailed visualizations, including bar charts and pie charts, ensuring a clear and comprehensive understanding of data trends and relationships.

Interview data was analysed to extract qualitative insight into industry expectations, challenges faced by institutes and industry, and potential strategies. The process involved transferring interviews to text format, systematically coding data and identifying overarching themes and actionable insights. The results were presented using a combination of statistical chart and qualitative summary to provide a comprehensive view. Suggestions for improvement in skill development programs were included.

Content analysis of secondary data, including institutional reports and pre-existing studies, complemented primary data by providing additional insights. Both numerical and textual data related to skill development trends was reviewed, and then the information was classified into themes such as Bridging Strategies and Recommendations**,** Culturally Rooted Education, Educator Perspectives and Limitations, Industry Expectations and Feedback, Misalignment Between Academic Curriculum and Industry Needs, Perceived Value of Academic Education

and Student and Fresher Readiness The secondary data insight was then compared with primary data to identify aligned and conflicting viewpoints, which increased the depth and reliability of overall analysis.

The study used the methodological triangulation to integrate insights from surveys, interview and content analysis, ensuring that the themes obtained from qualitative data are aligned with statistical trends in quantitative data. This approach provided deep insights into the underlying reasons behind skill gaps and proposed actionable strategies to effectively address them. The findings will guide stakeholders in implementing actionable strategies to bridge these gaps, ensuring graduates are equipped with the 21st-century skills demanded by employers.

3.5 Limitations

This research acknowledges several limitations that may impact its findings. Qualitative data, being subjective, depends a lot on the individual's approach, which may be influenced by personal experiences and prejudices, potentially affecting the fairness of the results. Representation challenges may arise as the diversity of institutions, industries, and participants' backgrounds might not fully capture the breadth of challenges and requirements across different sectors or regions.

The study also faces logistical constraints, as collecting, analysing, and interpreting qualitative data is time and resource intensive. Additionally, the dynamic nature of the industry may render some conclusions less relevant over time if it is not contextualized with the ongoing trends and future predictions. Finally, ensuring participant confidentiality when discussing sensitive topics requires stringent safeguards, adding complexity to the research process.

To address the limitations, the study incorporated measures such as data anonymization, and strategies to ensure confidentiality and data security throughout the research process.

3.6 Ethical assurance

Various measures were employed to ensure safe and responsible handling of participant data to uphold the highest moral standards. All personal information, such as name and contact information, was removed to maintain the confidentiality of the participants and protect their privacy. Each participant was assigned a unique key for identification purposes, which was stored separately from the dataset to ensure privacy and prevent unauthorized access.

Both anonymized datasets and key mapping was stored in a secure system with restricted access, ensuring that no person can trace the data to its source. Participants were fully informed about the anonymous process and assured that their identity would not be stated in any conclusion or publication. These measures were carefully designed to protect the participant confidentiality while maintaining the integrity of the research process.

3.7 Summary

India's higher education system, despite being one of the largest globally with over 900 universities and 37.4 million students enrolled (AISHE, 2019), faces important challenges that are affecting its effectiveness. Only 26% of graduates are employable, and the academic structure is too rigid, the teaching quality is poor, and the teaching methods are out of date (Din, 2020). This is a big problem for the economy. Education remains largely focused on knowledge transfer rather than developing application-based skills, making it ill-suited for the demands of the digital age.

India's unemployment rate was reported at 54% in 2021 (ISR, 2021), which is a concerning statistic for a country with the largest young population. The ISR report highlights that this issue could be reduced by teaching critical behavioural skill, like critical thinking, soft skills, agility, and problem-solving which are often lacking due to inadequate institutional guidance. Many educational institutions don't keep up with the dynamic needs of the industry, emphasizing the importance of upskilling and updating course content. Coursera's Global Skills Report (2021) further reflects India's declining proficiency in data science, ranking the nation 68th globally—an alarming trend given how important data-driven fields are in the modern economy.

The rising unemployment trend, exacerbated by global economic slowdowns and limited job creation (Garousi, 2019; Din, 2020), calls for an urgent rethinking of educational approaches. Research suggests that aligning education with industry demands increases students' motivation and employment outcomes (Rosen, 2018). Graduates with practical skills are more likely to secure jobs, earn competitively and be suited to the evolving industry. This research methodology aims to address these gaps by exploring how institutional reforms, updated course content, and skill-based pedagogy can increase employability and better prepare graduates for the work environment.

CHAPTER IV:

RESULTS

4.1 Introduction

This mixed-method research investigates how university graduates, particularly those from the IT sector in India, are not equipped with the necessary skills and educational reforms to meet employers' demands. The study analyses the alignment between educational experiences and the skill requirements of the modern workforce, aiming to bridge the skill gaps for improved socio-economic development.

This study used Holland's Job-Fit Theory (Holland, 1997) as the theoretical framework, emphasizing the compatibility between individual abilities and job requirements. Bloom's Taxonomy (Anderson and Krathwohl, 2001) was incorporated to assess the cognitive and practical skill development necessary in educational curricula. These frameworks provide a foundation for understanding the interplay between education and employability.

The Consensus Theory is used to analyse the common ground between students, faculty, and industry regarding the skills required for employability, emphasizing the shared perceptions of essential competencies. The study applies Career Ecosystem Theory to explore the dynamic interplay between the individual, educational institutions, industry, and other stakeholders, highlighting how these elements collectively influence the employability of IT graduates.

The Theory of Reasoned Action examines students' attitudes, subjective norms and perceived behaviour, and how these influence their intentions and behaviours related to career preparation and employability. The Conceptual Framework of Employability structures the thesis. It provides a comprehensive understanding of the various factors—such as skills, experience, and academic preparation—contributing to an individual's employability in the IT

sector. The research explores several key questions that assess the alignment between academic education and the skills required for successful employment in the current job market. The study aims to identify the gaps between educational experiences and industry demands, with a focus on improving socio-economic development.

This chapter presents the study results and contains three major sections. The first section presents the study results from the primary sources collected (surveys and interviews). The second section presents the study results from secondary sources (content analysis). The third section summarizes the key points of chapter IV.

4.2 Results

This section presents an overview of the three categories of study participants, with details of the demographic characteristics of each group. The categories include students, industry professionals and coordinator/educator/faculty. In addition, the findings are presented according to the research questions.

Profiles of the Study Participants

Surveys

Students

Sample size for quantitative studies includes 304 engineering graduates from various engineering colleges. This number of participants allows for the more intensive and comprehensive analysis of the collected data. Different demographic details of the student participants are listed below.

Gender Distribution of Students

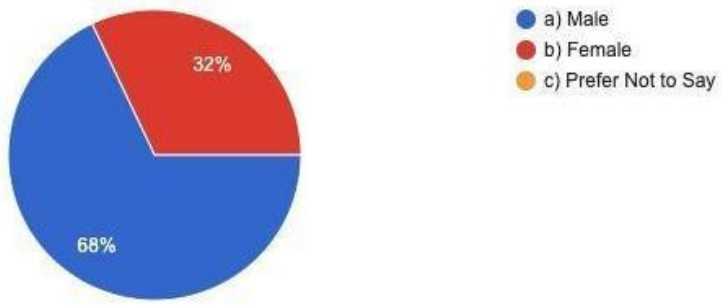

Figure 4.1 Gender Distribution of Students

Figure 4.1 shows the distribution for Gender of the students who participated in the survey, which shows there is large participation from males in comparison to the females. Out of the total respondents, 68% (206 of 304 participants) identified as male, while 32% (98 of 304 participants) identified as female. There were no responses under the category "Prefer Not to Say".

Graduation Institute Type

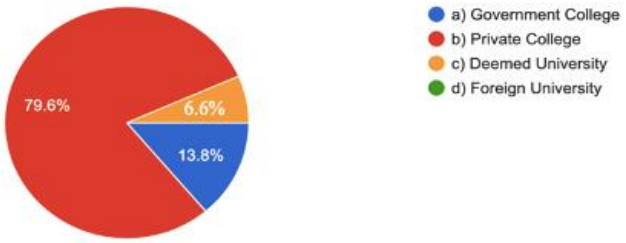

Figure 4.2 Graduation Institute Type

In Figure 4.2, the pie chart shows that 79.6% (241 of 304 participants) of respondents attended private colleges, while 13.8% (41 of 304 participants) attended government colleges, with a small percentage 6.6% (20 of 304 participants) attending deemed universities and no representation from foreign universities.

Students' Academic Performance So Far

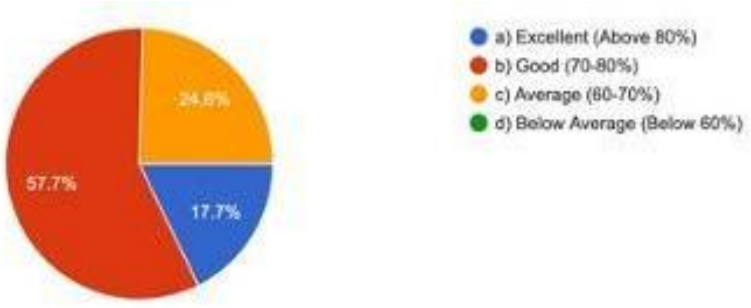

Figure 4.3 Students' Academic Performance So Far

The pie chart in figure 4.3 reflects the distribution of performance levels among a group based on percentage scores. 17.7% of the study participants (54 of 304) are performing at Excellent levels. Over half (57.7%, 175 of 304 participants) are in the good range, indicating consistent and strong performance. Nearly one-fourth (24.6%, 75 of 304 participants) are in the Average range, highlighting an area for potential improvement. No individuals are in the Below Average category.

Industry

The quantitative study mentioned earlier involved 47 industry participants. The survey captured responses from professionals with varying years of experience and job roles, mostly in mid-to-senior-level technical and leadership positions. This includes Team Leads, Senior Developers, Managers, and Data Analyst.

Gender Distribution for Industry Respondents

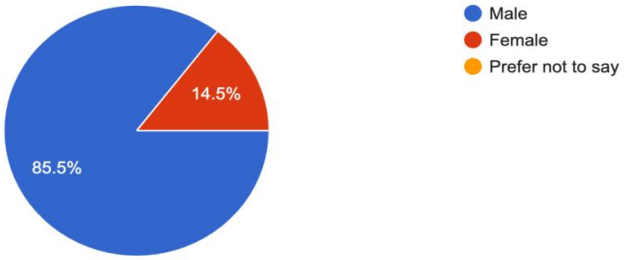

Figure 4.4 Gender Distribution for Industry Respondents

The Figure 4.4 displays the gender participation in the survey of industry perspectives. A significant majority, 85.5% (42 of 47 participants), identified as male, while only 14.5% (5 of 47 participants) identified as female. Notably, there were no responses under the "Prefer not to say" category.

Top 10 Roles of Respondents

Figure 4.5 Top 10 Roles of Respondents

The figure 4.5 shows the roles held by the respondents in their field of expertise. The majority of respondents are Senior Developers (20 of 47 respondents), followed by Team Leads (16 of 47 respondents). Other roles, such as Senior Executive, Junior Technician, SR Manager,

Co-founder, Senior Engineering Manager, Data Analyst, Senior Manager, and Marketing Manager, each have only 1 respondent.

Years of Experience in the Industry

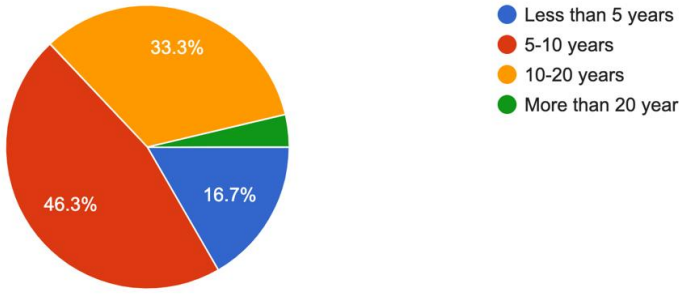

Figure 4.6 Years of Experience in the Industry

The Figure 4.6 contains the experience held by the participants expressed in number of years. The largest segment, 46.3% (26 of 47 respondents) has 5 to 10 years of experience, followed by 33.3% (15 of 47 respondents) who have 10 to 20 years of experience. Only 16.7% (3 of 47 respondents) of respondents have less than 5 years, and a minimal 3.7% (2 of 47 respondents) have more than 20 years of experience.

Interviews

Course Coordinator/Educator/Faculty

Interviews were conducted for the qualitative study of eight (8) participants consisting of coordinator/educator/faculty from different universities, providing diverse perspective on curriculum and pedagogy capturing unique institutional and regional contexts.

Faculty Qualification Level

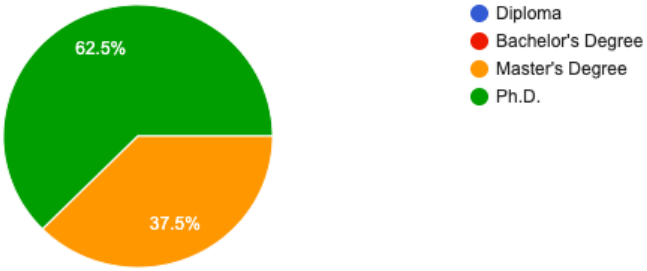

Figure 4.7 Faculty Qualification Level

Figure 4.7 indicates the qualifications level of the faculty participating in the interview. A majority, 62.5% (5 of 8 respondents) hold a Ph.D., while the remaining 37.5% (3 of 8 respondents) possess a Master's Degree. Notably, there are no respondents with a Diploma or Bachelor's Degree.

Faculty: Current Role of Participant

Figure 4.8 Faculty: Current Role of Participant

Figure 4.8 shows the faculty participation's current role in their field. The largest group, 37.5% (3 of 8 respondents) comprises Directors, Heads of Departments (HoDs), or Senior Managers. Both Owners/Founders and Assistant Professors represent 25% (2 of 8 respondents) each. The smallest group, 12.5% (1 of 8 respondents) includes a Former HoD and Assistant Professor from VJTI, Mumbai. Notably, no respondents identified as Middle Management or Consultant/Advisor in this dataset.

4.3 Findings: Results for Research Questions

Findings from engineering students' perspective. The study participants representing engineering students comprised of 304 students from different universities. The findings from their perspectives were based on 41 survey questions.

Findings for RQ1. How do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment? This in-depth research explores student perspectives to provide academic leaders with detailed, actionable insights. Drawing on survey responses from engineering students across India, the researcher collected details for motivation, performance, perceived gaps, and concrete suggestions for curriculum enhancement. Each insight is supported by visual data and structured to inform decisions effectively.

Preparedness for First job

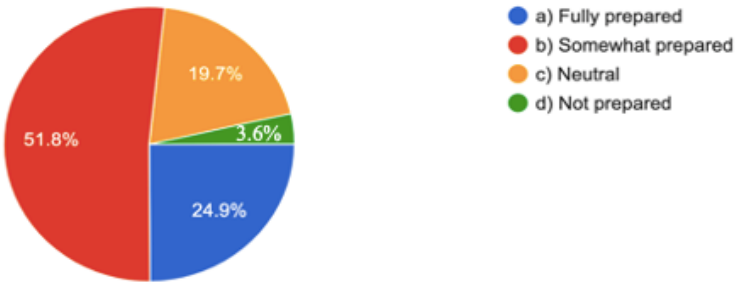

Figure 4.9 Preparedness for First job

In Figure 4.9, the pie chart illustrates that 51.8% (157 of 304 respondents) of respondents feel somewhat prepared for their first job, 24.9% (76 of 304 respondents) feel fully prepared, 19.7% (59 of 304 respondents) are neutral, and a small percentage 3.6% (11 of 304 respondents) feel not prepared.

Value that Students Assign to Academic Knowledge

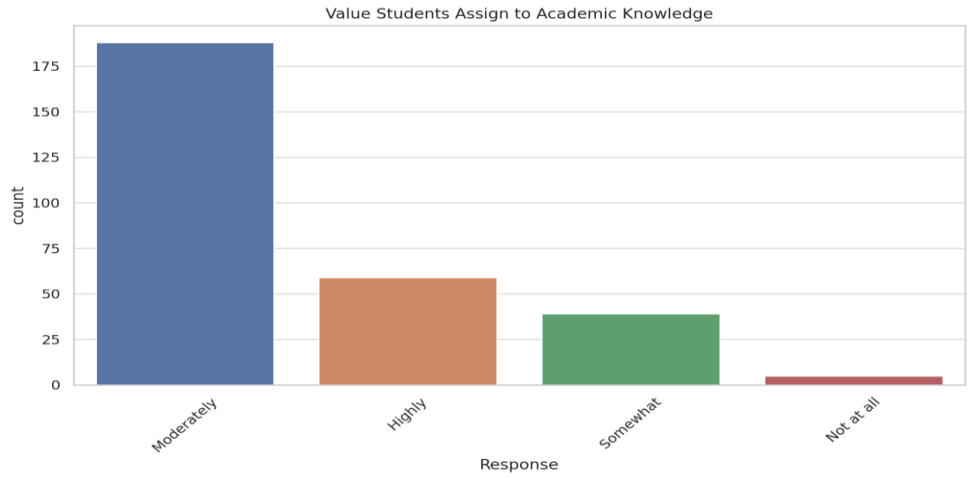

Figure 4.10 Value that Students Assign to Academic Knowledge

The bar chart in figure 4.10 displays how students value academic knowledge. Students were asked to rate how much value they place on academic knowledge in their education. This reflects the extent to which traditional teaching is seen as beneficial in today's context.

Most students, 62% (191 out of 304 respondents) assigned a moderate value to academic knowledge, indicating a balanced recognition of its importance. A smaller group of students, 20% (61 out of 304 respondents) rated academic knowledge highly valuable, while 12.5%(38 out of 304 respondents) assigned it a somewhat value. Less than1% (14 out of 304 respondents)felt that academic knowledge was not valuable.

Should Schools Teach Mental Health and Emotional Skills

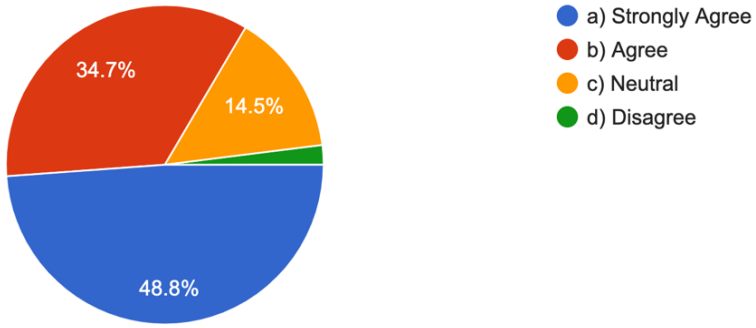

Figure 4.11 Should Schools Teach Emotional and Mental Health Skills

The above pie chart reveals that most respondents strongly support that schools should teach skills to help cope with emotional and mental health. 48.8% (148 of 304 respondents) of respondents strongly agreed, indicating a significant recognition of the importance of such education. Additionally, 34.7% (105 of 304 respondents) agreed with the idea, although not as emphatically. A smaller portion of respondents, 14.5% (44 of 304 respondents), expressed neutral opinions, neither fully agreeing nor disagreeing. Less than 1% (7 of 304 respondents) of the respondents disagreed.

Satisfaction with Opportunities to Develop Practical Skills

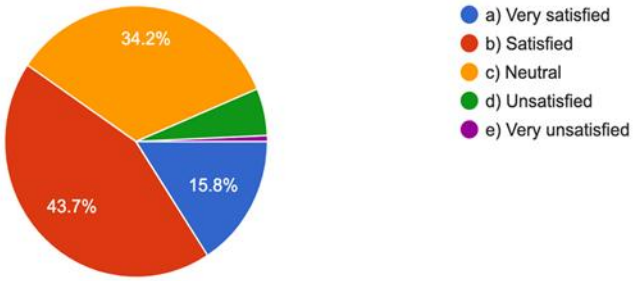

Figure 4.12 Satisfaction with opportunities to develop Practical Skills

The pie chart represents respondents' satisfaction levels regarding opportunities to develop practical skills beyond academic learning. The largest proportion, 43.7% (123 of 304

respondents), reported being "Satisfied" with these opportunities. A significant portion, 34.2% (96 of 304 respondents), remained "Neutral," indicating neither satisfaction nor dissatisfaction. Meanwhile, 15.8% (45 of 304 respondents) expressed being "Very Satisfied," showing strong approval. A small minority reported dissatisfaction, with 5% combining "Unsatisfied" (4.8% (16 of 304 respondents)) and "Very Unsatisfied" (0.2% (2 of 304 respondents)).

Performance Vs. Effort

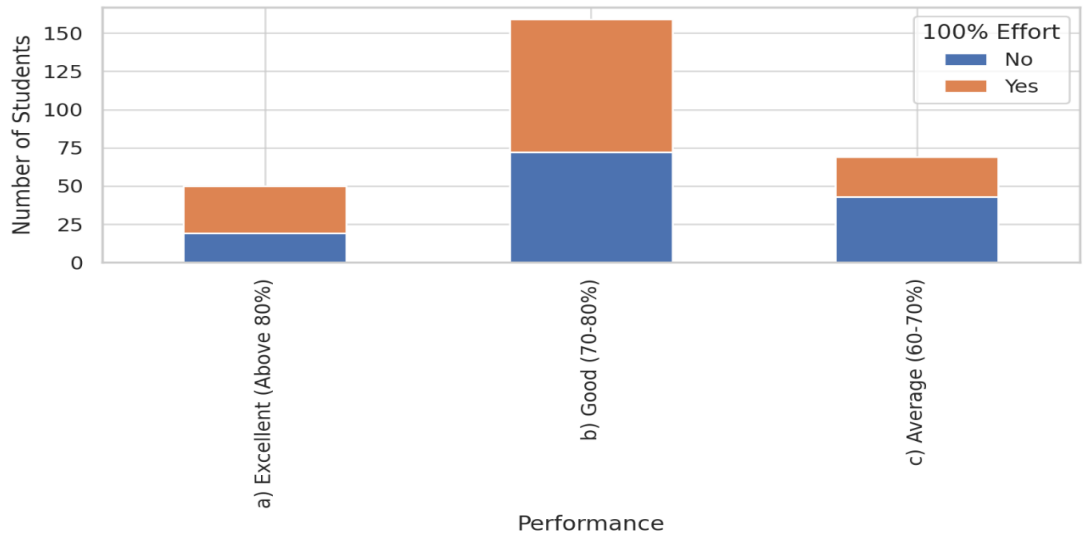

Figure 4.13 Performance Vs. 100% Effort

The bar chart in figure 4.13 compares student performance with their effort, showing the number of students in each performance category based on whether they gave 100% effort. A comparison between students' academic performance and whether they put in 100% effort during the course can indicate results are based on personal commitment levels or not.

Of the 54 out of 304 respondents who performed excellently (Above 80%), 60%(32 out of 54 respondents) reported giving 100% effort (shown in orange), while 21 out of 54 respondents were able to get results without putting in their 100% effort (shown in blue)implying that other factors may also influence performance. 174 of 304 respondents in the Good

Performance (70-80%) group shows 50%(87 of 304 respondents) who reported giving 100% effort and being able to perform “Good”, suggesting effort strongly correlates with the results.

Out of the 75 of 304 respondents in the Average performance (60-70%) category, 52 students reported not giving 100% effort, which may contribute to their relatively lower academic achievement.

Priorities in the Job Market vs. Interest in Engineering

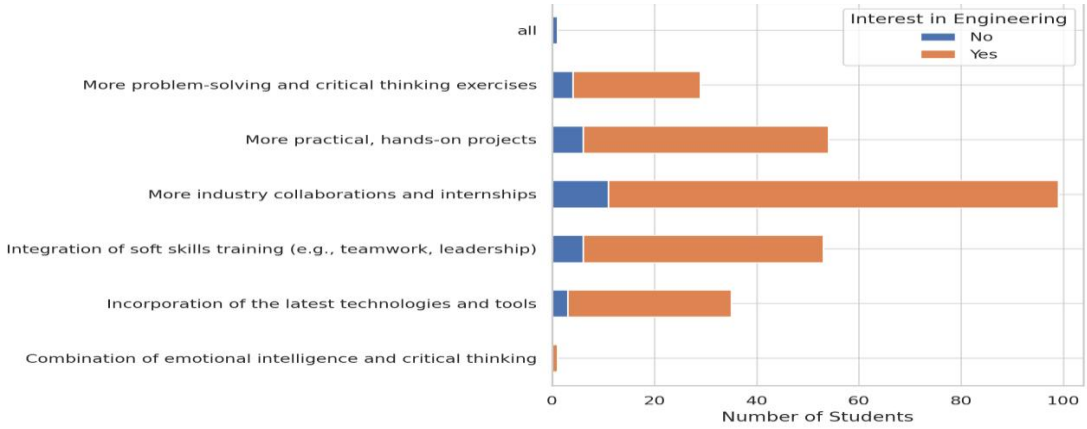

Figure 4.14 Priorities in the Job Market vs. Interest in Engineering

The bar chart in figure 4.14 compares students' interest in engineering and their perception of priorities for job market readiness. The bar chart clearly shows irrespective of their interest in engineering or not, their ratings for job market readiness skills were similar. Among students interested in engineering and not interested, the highest priority is "More industry collaborations and internships," with 33.2% (101 of 304 respondents) indicating its importance. This is followed by "Integration of soft skills training (e.g., teamwork, leadership)" 20% (61 of 304 respondents), “More practical, hands-on projects" 18% (55 of 304 respondents), and "More problem-solving and critical thinking exercises" 10.1(31 of 304 respondents). "Incorporation of

the latest technologies and tools" has 11.5% (35 of 304 respondents), and "Combination of emotional intelligence and critical thinking" received less than 1% (1 of 304 respondents).

Belief in Continual Learning

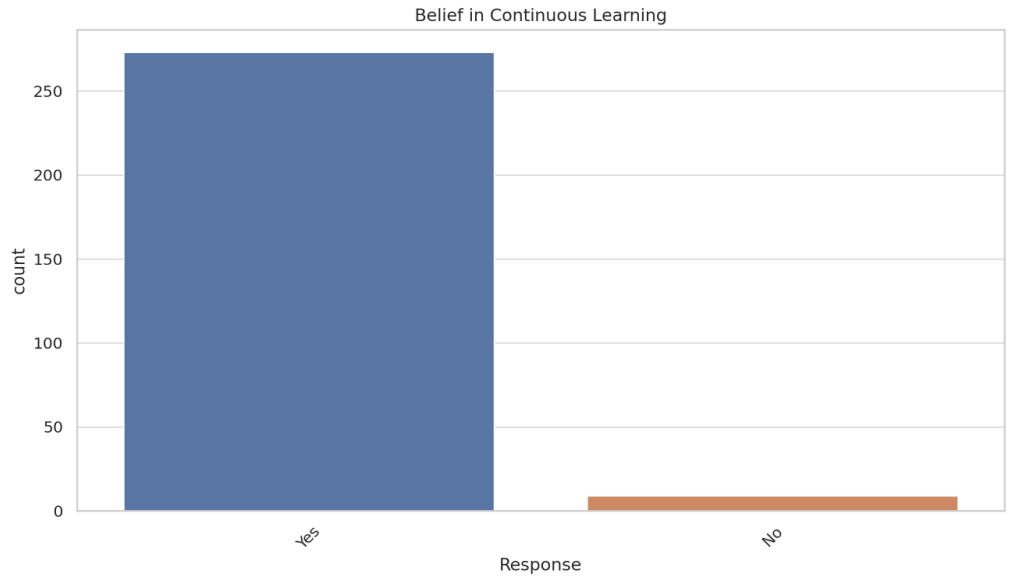

Figure 4.15 Belief in Continual Learning

The aim of the graph is to determine whether their education has instilled in them the importance of Continual Learning. An overwhelming majority, with 90.4% (275 of 304 respondents), answered "Yes," indicating they believe in the importance of continual learning. In contrast, less than 1% (11 of 304 respondents) answered "No".

Students Encouraged to Develop Hobbies and Creative Interests

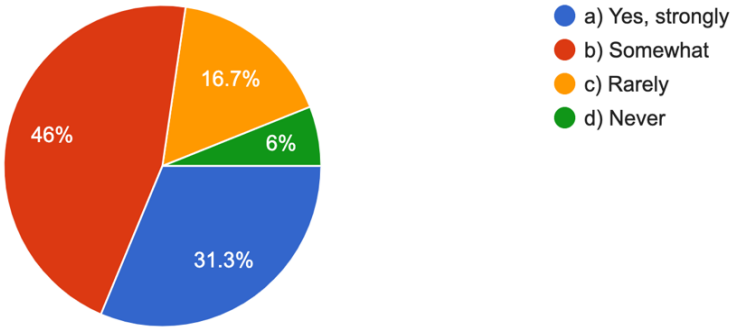

Figure 4.16 Students Encouraged to Develop Hobbies and Creative Interests

The pie chart in figure 4.16 displays responses regarding encouragement to develop hobbies or creative interests. Approximately 31.3% (94 of 304 respondents) of students felt they were "Strongly" encouraged, while 46% (136 of 304 respondents) reported being "Somewhat" encouraged. A smaller portion, 16.7% (50 of 304 respondents), indicated they were "Rarely" encouraged, and 6% (18 of 304 respondents) said they were "Never" encouraged.

Student's feedback on Familiarity with the Corporate Workspace

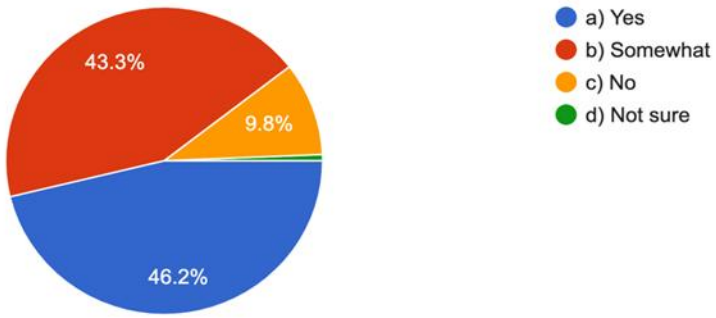

Figure 4.17 Student's feedback on Familiarity with the Corporate Workspace

The pie chart presents student feedback on their familiarity with the corporate workspace. Nearly half of the respondents ,46.2% (140 of 304 respondents) indicated "Yes," confirming they are familiar with the corporate environment. A close proportion, 43.3% (132 of 304 respondents), responded with "Somewhat," showing partial familiarity. A smaller segment, 9.8%

(30 of 304 respondents), reported "No," indicating they are not familiar, while a minimal fraction 1% (1 of 304 respondents) selected "Not sure."

Learning to Deal with Difficult Emotions

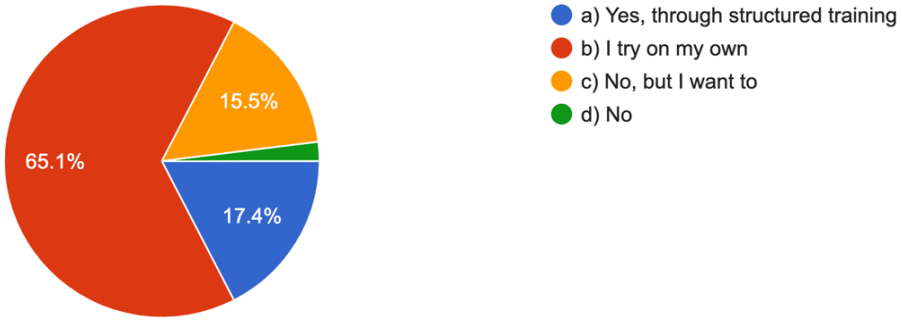

Figure 4.18 Learning to Deal with Difficult Emotions

The pie chart in figure 4.18 illustrates the responses to whether they have ever learned how to deal with anger, frustration or fear constructively. The majority, 65.1% (198 of 304 respondents), reported that they "try on my own" to develop these skills. A smaller portion, 17.4% (53 of 304 respondents), indicated learning "through structured training." 15.5% (47 of 304 respondents) expressed that they have not learned yet but want to. Only a minimal fraction, around 2% (6 of 304 respondents), stated that they have not learnt to deal with difficult emotions.

Students' View About the Gap between Academia and Industry Expectation

Figure 4.19 Students' View About the Gap between Academia and Industry Expectation

The pie chart in figure 4.19 represents the responses to "What do you think is the biggest gap between your academic education and industry expectations?"

The majority, 56.7% (159 of 304 respondents), identified "Lack of hands-on experience and practical exposure" as the primary cause. Other notable reasons include "Lack of exposure to industry-specific tools and technologies" at 14.5% (41 of 304 respondents), "Insufficient focus on soft skills (e.g., communication, teamwork)" at 12.4% (35 of 304 respondents), "Lack of focus on critical thinking and problem-solving" at 7% (22 of 304 respondents) and "Outdated technical knowledge" at 6% (17 of 304 respondents). While a minor fraction (1 respondent) selected "Not Applicable."

Inclusion of Key Employability skills in Academic Curriculum

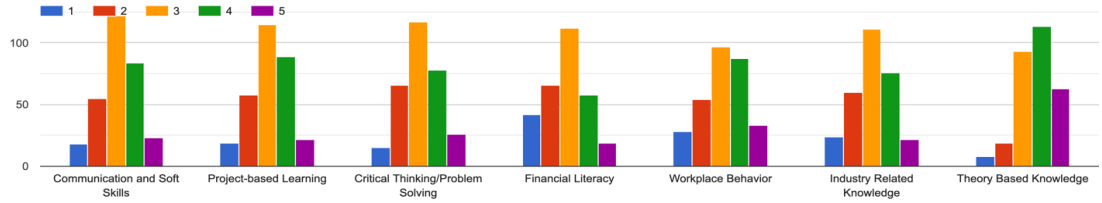

Figure 4.20 Inclusion of Key Employability skills in Academic Curriculum

The bar chart in figure 4.20 reflects students' perceptions of Employability skills covered in Academic Curriculum across seven categories. Data is rated on a Likert scale where 1 is “Not Covered” and 5 is “Covered in Depth”.

Table 4.1 Inclusion of Key Employability skills in Academic Curriculum

Rating / Category	Communication and Soft Skills	Project-based Learning	Critical Thinking/Problem Solving	Financial Literacy	Workplace Behaviour	Industry Related Knowledge	Theory Based Knowledge
1	18	19	15	42	28	24	8
2	55	58	66	66	54	60	19
3	122	115	117	112	97	111	93
4	84	89	78	58	87	76	113
5	23	22	26	19	33	22	63

The chart indicates Theory-Based Knowledge receives strong focus in traditional academic content. Industry-Related Knowledge, Communication and Soft Skills and Project-Based Learning are moderately aligned.

Findings from course coordinator/educator/faculty perspective. The study included insights from eight participants in academic and administrative roles such as Directors, Heads of Departments (HoDs), Senior Managers, Owners/Founders, and Assistant Professors. The findings are based on data collected through 33 semi-structured interview questions

Findings for RQ2. What challenges do faculty members identify in aligning the curriculum with evolving industry requirements and in ensuring effective skill delivery? Aligning academic curricula with industry's evolving needs is a significant challenge for faculty members in many academic institutions. In the qualitative interviews and reports, faculty members highlighted several barriers that impede integrating industry-relevant skills into the

academic framework. These challenges range from resource limitations to the lack of faculty development opportunities and resistance to pedagogical changes.

This report presents an analysis of faculty responses aimed at understanding why many engineering graduates lack key job skills such as communication, teamwork, and problem-solving. Despite awareness within academia, a gap persists in preparing students for industry demands. The goal of this analysis is to highlight the root causes from a faculty perspective and inform improvements in curriculum design.

Ways in which faculty upgrade themselves

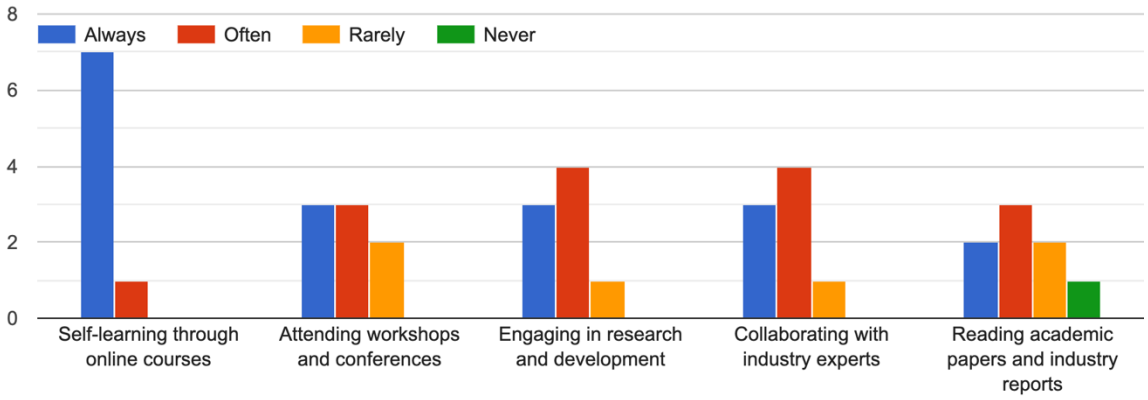

Figure 4.21 Ways in which faculty upgrade themselves

The bar chart illustrates how course coordinators/educators/faculties keep themselves updated with developments in the IT industry using a 4-point Likert Scale with the categories: Always, Often, Rarely, and Never.

Table 4.2 Ways in which Faculty Upgrade Themselves

Activity	Always	Often	Rarely	Never
Self-learning through online courses	7	1	0	0

Attending workshops and conferences	3	3	2	0
Engaging in research and development	3	4	1	0
Collaborating with industry experts	3	4	1	0
Reading academic papers and industry reports	2	3	2	1

The most consistently practiced method is self-learning through online courses, with 7 respondents indicating "Always" and only 1 saying "Often," reflecting a strong personal initiative for continuous learning. In contrast, activities such as Attending workshops and conferences, Engaging in research and development and collaborating with industry experts received a more even spread across all four categories, showing diverse engagement levels.

Overall, the chart suggests that individual-driven methods like self-learning are more consistently practiced compared to institution- or event-driven methods.

Biggest Challenges faced in Staying Updated With IT Trends

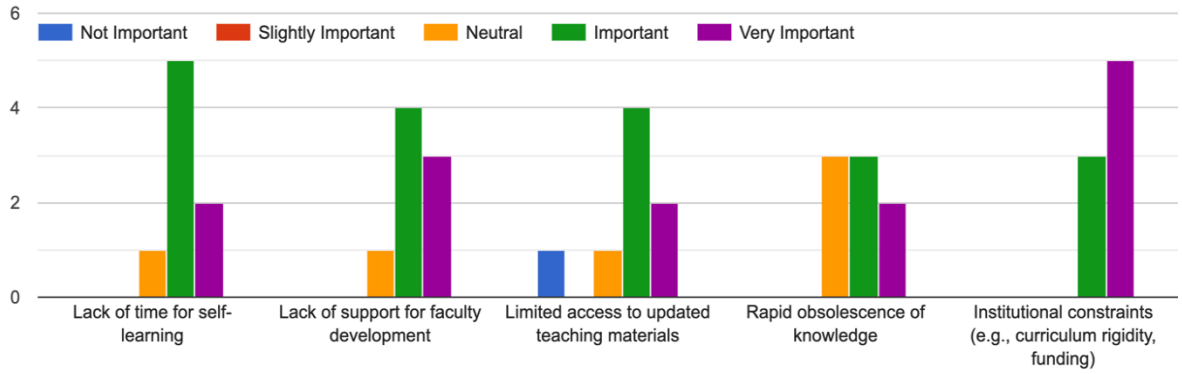

Figure 4.22 Biggest Challenges faced in Staying Updated With IT Trends

The bar graph illustrates the challenges faced in staying updated with IT trends, based on a Likert Scale, ranging from "Not Important" to "Very Important."

Table 4.3 Biggest Challenges in Staying Updated With IT Trends

Challenge	**Not Important (1)**	**Slightly Important (2)**	**Neutral (3)**	**Important (4)**	**Very Important (5)**
Lack of time for self-learning	0	0	1	5	2
Lack of support for faculty development	0	0	1	4	3
Limited access to updated teaching materials	1	0	1	4	2
Rapid obsolescence of knowledge	0	0	3	3	2
Institutional constraints (e.g., curriculum rigidity, funding)	0	0	0	3	5

Among the listed challenges, “Institutional constraints (e.g., curriculum rigidity, funding)” was the strongest concern, with 5 out of 8 respondents rating it as “Very Important” and 3 out of 8 respondents as “Important”, indicating it as a major barrier. “Lack of time for self-learning” was viewed “Important” by 5 out of 8 respondents and “Very Important” by 2 out of 8 respondents and “Not Important” by 1 out of 8 respondents.

“Limited access to updated teaching materials” drew a mixed response, with 4 out of 8 respondents rating it as “Important” and 2 out of 8 respondents as “Very Important”, though it also had 1 response each for Not Important and Neutral.

Overall, most challenges scored high on the importance scale, with almost no respondents rating any challenge as “Not Important” or “Slightly Important” reflecting a general consensus that all listed issues are meaningful obstacles to keeping up with IT trends.

Digital Tools Used by Faculty for Teaching

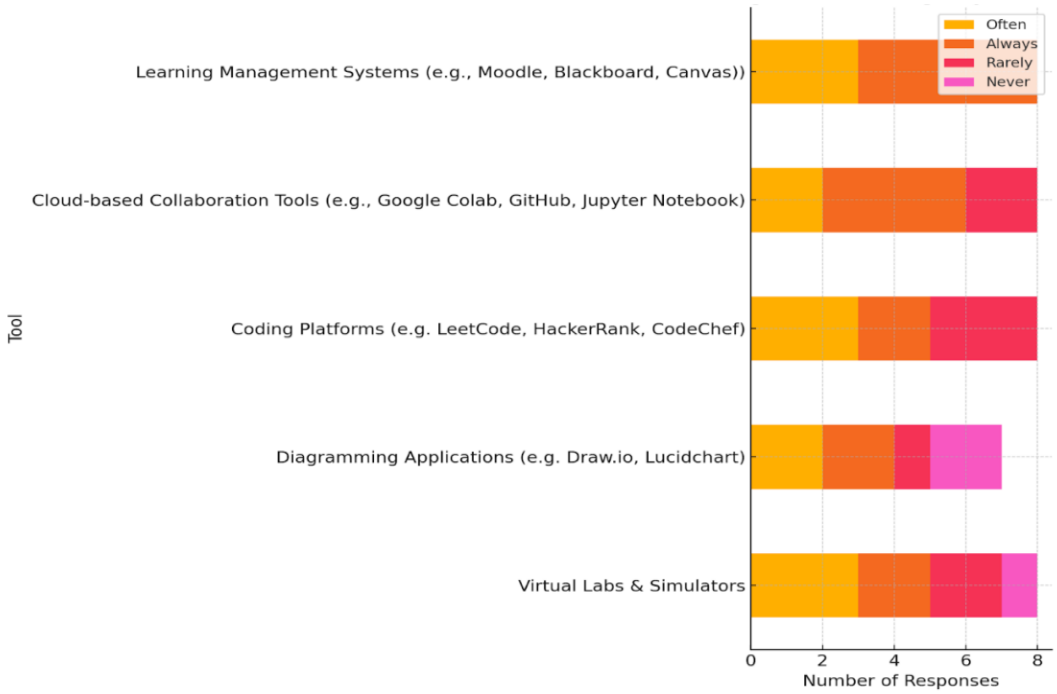

Figure 4.23 Digital Tools Used by Faculty for Teaching

The figure 4.23 shows the frequency of use of digital tools by faculty, focusing on tools such as Learning Management Systems (LMS), cloud-based collaboration tools, coding platforms, diagramming applications, and virtual labs.

Table 4.4 Digital Tools Used by Faculty

Category	Virtual Labs & Simulators	Diagramming Applications (Draw.io, Lucidchart)	Coding Platforms (LeetCode, HackerRank, CodeChef)	Learning Management Systems (Moodle, Blackboard, Canvas)	Cloud-based Collaboration Tools (e.g., Google Colab, GitHub)
Always	2	2	2	5	4
Often	3	2	3	3	2
Rarely	2	1	3	0	2
Never	1	2	0	0	0

Learning Management Systems like Moodle, Blackboard and Canvas are the most frequently used tools, with a significant number of faculty members reporting "Always" or "Often" usage, indicating that these tools are essential for delivering and managing courses and learning activities. Cloud-based Collaboration Tools (e.g., Google Colab, GitHub, Jupyter Notebook) and Coding Platforms (e.g., LeetCode, HackerRank, CodeChef) are also used to a large extent, particularly for facilitating collaborative, real-time work and coding challenges among students and faculty, though slightly less than LMS.

Diagramming Applications (e.g., Draw.io, Lucidchart) and Virtual Labs and Simulators show less engagement, with some faculty indicating "Rarely" or "Never".

New IT Technologies Recently Introduced To Students

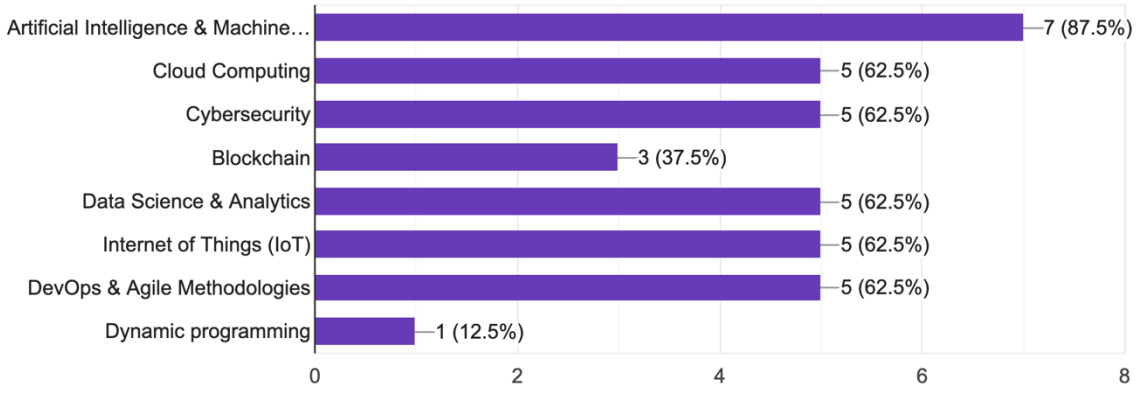

Figure 4.24 New IT Technologies Recently Introduced To Students

The bar chart displays data from 8 responses to the question: "Which new IT technologies have you recently introduced your students to?"

Artificial Intelligence & Machine Learning emerged as the most frequently introduced technology, with 87.5%(7 out of 8 respondents). Other technologies—Cloud Computing, Cybersecurity, Data Science & Analytics, Internet of Things (IoT), and DevOps & Agile Methodologies—each received 62.5%(5 out of 8 respondents), showing strong representation in curricula. Blockchain was introduced by 37.5%(3 out of 8 respondents), while Dynamic Programming was the least introduced, with only 12.5%(1 out of 8 respondents)

This distribution shows that educators are prioritizing emerging technologies like AI, Cloud, and IoT, which align with current industry trends, while topics like Dynamic Programming are less emphasized in recent introductions

Teaching Strategies Adopted By Faculty To Enhance Student Engagement

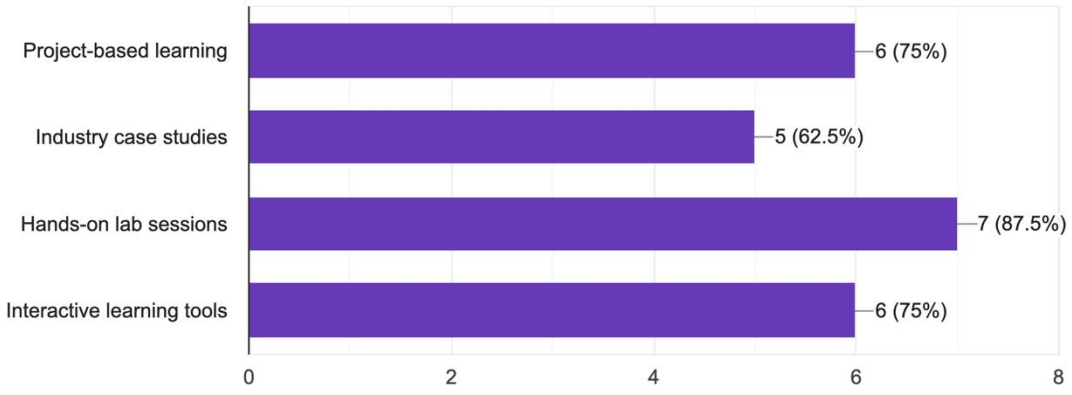

Figure 4.25 Teaching Strategies Adopted By Faculty To Enhance Student Engagement

The bar chart illustrates the teaching strategies adopted by educators to enhance student engagement. The most widely used strategy is hands-on lab sessions, adopted by 87.5%(7 out of 8 respondents), indicating a strong preference for experiential learning approaches. Project-based learning and interactive learning tools follow closely, with each being implemented by 75%(6 out of 8 respondents), showing educators' emphasis on active, participatory learning. Industry case studies were used by 62.5%%(5 out of 8 respondents), reflecting a slightly lower but still significant use of real-world application methods in teaching.

Overall, the chart highlights that educators are employing a variety of practical and interactive strategies to foster student engagement, with a strong leaning toward experiential and technology-enhanced learning.

Methods Used By Educators To Assess Students' Industry Readiness

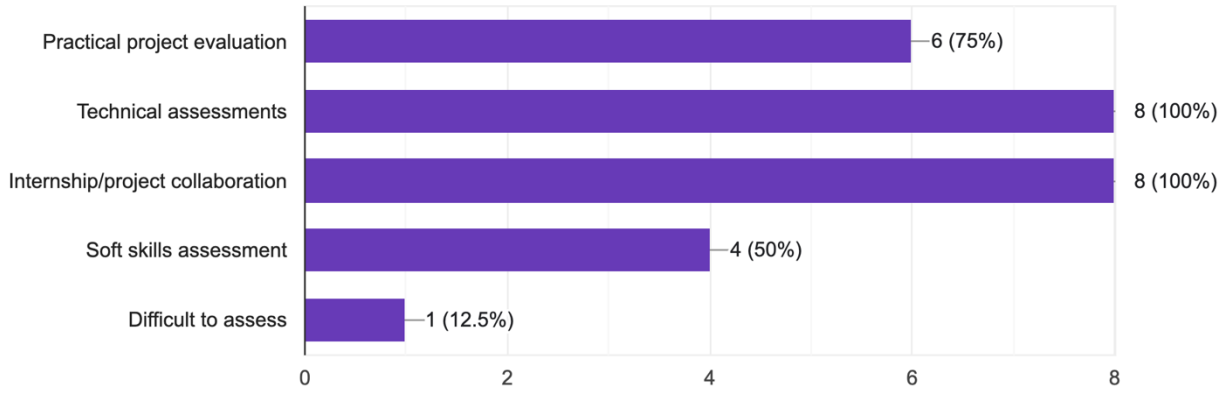

Figure 4.26 Methods Used By Educators To Assess Students' Industry Readiness

The bar chart presents Methods used by educators to assess students' industry readiness. The most universally used methods are technical assessments and internship/project collaboration, with all 8 respondents (100%) selecting both. This indicates a strong emphasis on evaluating technical competence and real-world work experience.

Practical project evaluation was also widely used, with 6 out of 8 respondents (75%) incorporating it into their assessment methods. Soft skills assessment, although critical for employability, was reported by only 4 out of 8 respondents (50%), suggesting it receives comparatively less focus. Only 1 out of 8 respondent (12.5%)—indicated that assessing industry readiness is difficult, highlighting possible challenges in designing comprehensive assessment frameworks. In summary, the chart shows that technical and experiential learning metrics are well established in assessing readiness, while soft skills are not.

Findings from industry perspectives. The study participants representing the industry perspective comprised of 47 professionals holding diverse roles, including Senior Developers, Team Leads, Senior Executives, Junior Technicians, Senior Managers, Co-founders, Senior

Engineering Managers, Data Analysts, and Marketing Managers. The findings from their perspectives were based on responses to 26 research questions.

Findings for RQ3. What key skills and competencies needed for successful employment in today's job market are lacking?

Preparedness of Fresh Graduates for Roles in Terms of Technical Skills

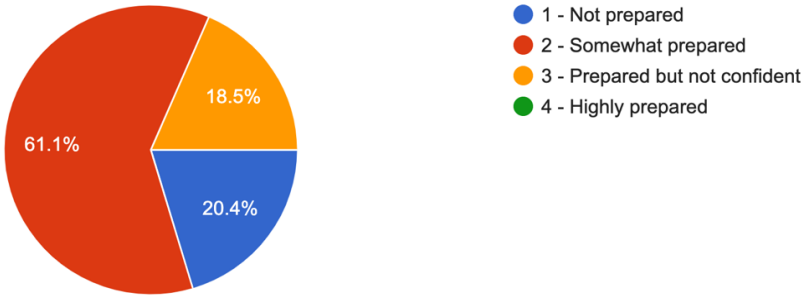

Figure 4.27 Preparedness of Fresh Graduates for Roles in Terms of Technical Skills

The pie chart depicts the assessment of technical skill preparedness of fresh graduates from the industry perspective. It reveals that 61.1% (29 of 47 respondents) of the respondents believe recent graduates are "Somewhat prepared" for technical demands in the industry. 20.4% (9 of 47 respondents) think graduates are not prepared, while 18.5% (8 of 47 respondents) feel they are prepared but not confident.

Rating of Fresh Graduates for Soft Skills

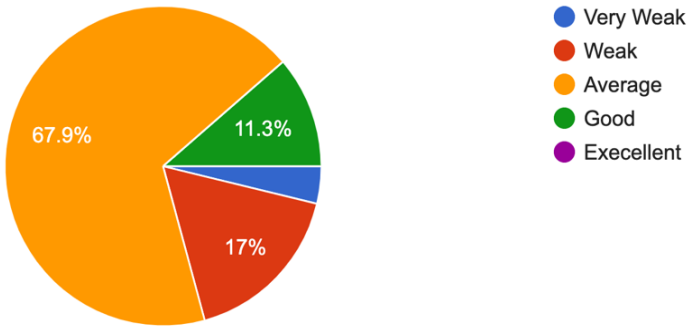

Figure 4.28 Rating of Fresh Graduates for Soft Skills

The pie chart in figure 4.28 reflects industry's view regarding the soft skills of fresh graduates, specifically in areas such as communication, teamwork, and problem-solving. 67.9% (31 of 47 respondents) of industry professionals feel that graduates demonstrate "Average" i.e. only basic soft skills. A smaller portion, 17% (8 of 47 respondents), rated them as "Weak," while 11.3% (5 of 47 respondents) considered the soft skills "Good". Only 3.8% (2 of 47 respondents) rated them as "Very Weak," and none rated the soft skills as "Excellent".

Alignment of Academic Curriculum with Industry needs

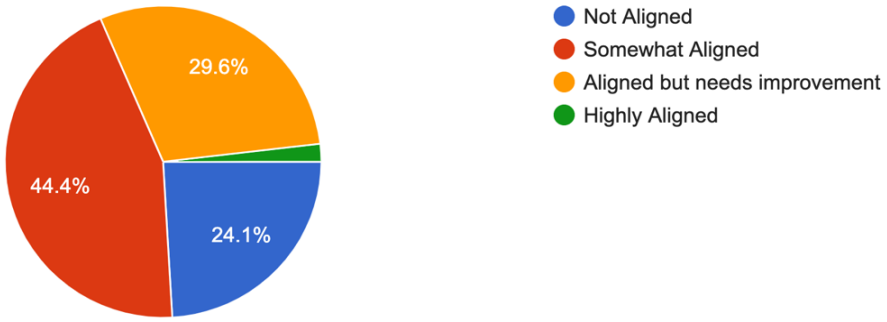

Figure 4.29 Alignment of Academic Curriculum with Industry needs

The pie chart in figure 4.29 shows industry perspective on the alignment of the current academic curriculum with industry needs. A smaller segment 2.7% (1 of 47 respondents) considers it "Highly Aligned" while most respondents 44.4% (21 of 47 respondents) believe that

the curriculum is "Somewhat Aligned," indicating that it meets industry requirements to a degree. A significant portion (29.6%) (13 of 47 respondents) think the curriculum is "Aligned but needs improvement".

On the other hand, 24.1% (12 of 47 respondents) believe it is "Not aligned" with industry needs.

Collaboration for Academic Developments

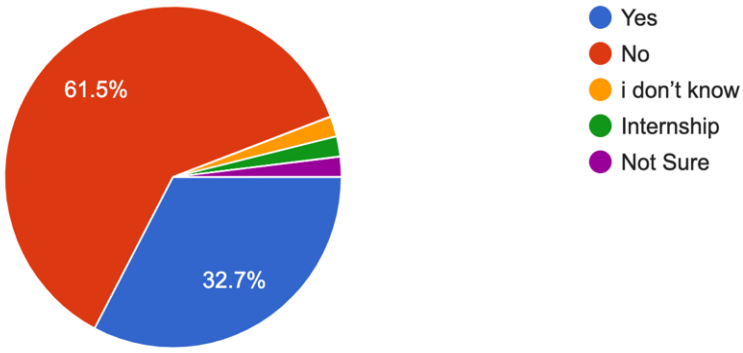

Figure 4.30 Collaboration for Academic Developments

The pie chart in figure 4.30 displays responses from the industry to the question of whether organizations have collaborated with academic institutions for curriculum development, guest lectures, internships, or skill training programs. A majority of respondents 61.5% (29 of 47 respondents) indicated that they have not collaborated, suggesting a lack of collaboration.

About 32.7% (16 of 47 respondents) responded "Yes," affirming collaboration exists. In the "Other" option, small percentages said "I don't know" 3% (2 of 47 respondents), 1.3% said through "Internship" (1 of 47 respondent), and 1.3% said "Not Sure" (1 of 47 respondents)

Effectiveness of the Industry-Academia Initiatives

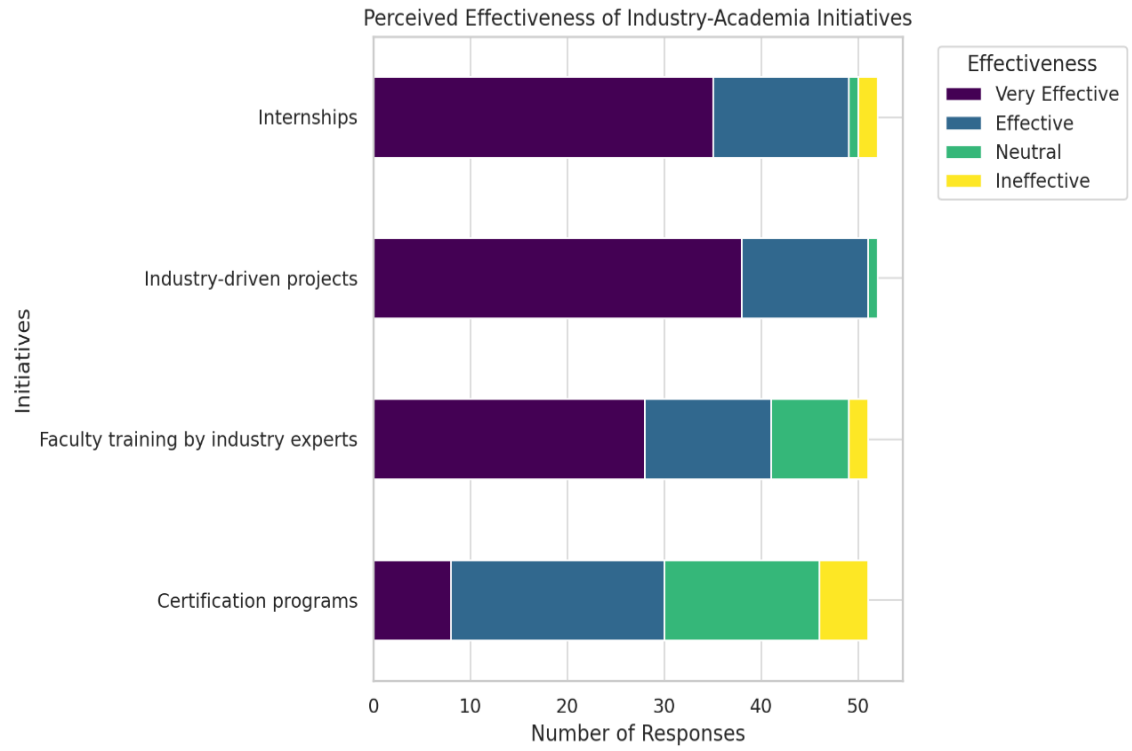

Figure 4.31 Effectiveness of the Industry-Academia Initiatives

The bar chart in figure 4.31 illustrates the perceived effectiveness of various industry-academia initiatives by the industry. The initiatives surveyed include internships, industry-driven projects, faculty training by industry experts, and certification programs.

Table 4.5: Effectiveness of the Industry-Academia Initiatives

Initiative Type	Very Effective	Effective	Neutral	Ineffective
Internships	31	13	1	2
Industry-driven projects	36	10	1	0
Certification programs	8	18	16	4
Faculty training by industry experts	27	11	7	1

Industry-driven projects also received highest count (36 of 47 respondents) of "Very Effective" category, followed by "Effective" and minimal neutrality. Most respondents (31 of 47 respondents) rated internships as "Very Effective," with a few (13 of 47 respondents) markings them as "Effective." This reveals that Industry-driven projects are perceived as the most effective industry-academia initiative, and provide meaningful, practical exposure that is highly valued by respondents.

Faculty training by industry experts had quite a few (27 of 47 respondents) “Very Effective” along with Neutral and a few Ineffective responses.

Certification programs were rated as “Very Effective” by 8 of 47 respondents and “Effective” by 18 of 47 respondents, with 16 of 47 respondents stating “Neutral” and 4 of 47 respondents stating “Ineffective”, suggesting variability in how this initiative is delivered or perceived.

Findings from Primary Sources: A Comparison of Survey and Interview Results

The researcher collected primary data from three distinct stakeholder groups, 304 Engineering students, 47 Industry professionals and 8 course coordinators/educators/faculties each offering unique perspectives.

Collectively, these primary sources enabled a triangulated analysis, allowing for a comprehensive comparison of survey-based findings from students and industry professionals with interview-based insights from academic leadership, thus offering a holistic understanding of expectations and experiences across the educational ecosystem.

Findings for RQ4. To what extent do students, freshers, faculty members and industry agree on the key skills and essential competencies for successful employment in today's job market?

Most Important Skills Today for the Youth

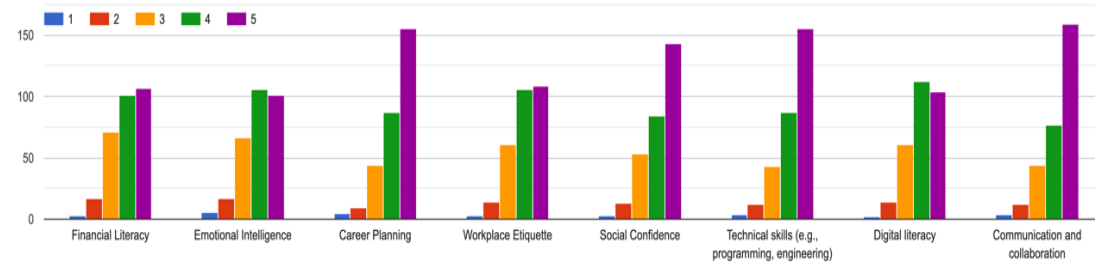

Figure 4.32 Most Important Skills Today for the Youth

The bar graph presents the distribution of responses on the importance of various skills for youth today, rated on a scale from 1 to 5, with 5 indicating the highest importance.

Table 4.5 Most Important Skills Today for the Youth

Rating	Financial Literacy	Emotional Intelligence	Career Planning	Team Collaboration	Social Confidence	Technical Skills	Digital Literacy	Communication
1	3	6	5	3	3	4	2	4
2	17	17	9	14	13	12	14	12
3	71	66	44	61	53	43	61	44
4	101	106	87	106	84	87	112	77
5	107	101	155	109	143	155	104	159

Among the skills listed, "Career Planning", "Communication " and "Technical Skills (e.g., programming, engineering)" received the highest counts of top ratings (5), each surpassing

150 out of 304 responses. "Social Confidence" also has substantial numbers of top ratings at 143 out of 304 responses. Skills like “Digital Literacy”, "Financial Literacy," "Emotional Intelligence," and " Team Collaboration " show a distribution across the mid to high rating categories, with fewer respondents assigning the lowest ratings. The lowest importance ratings (1 and 2) are minimal across all skills, indicating general agreement on the relevance of the mentioned skills.

Skills Faculty Believe Need More Emphasis

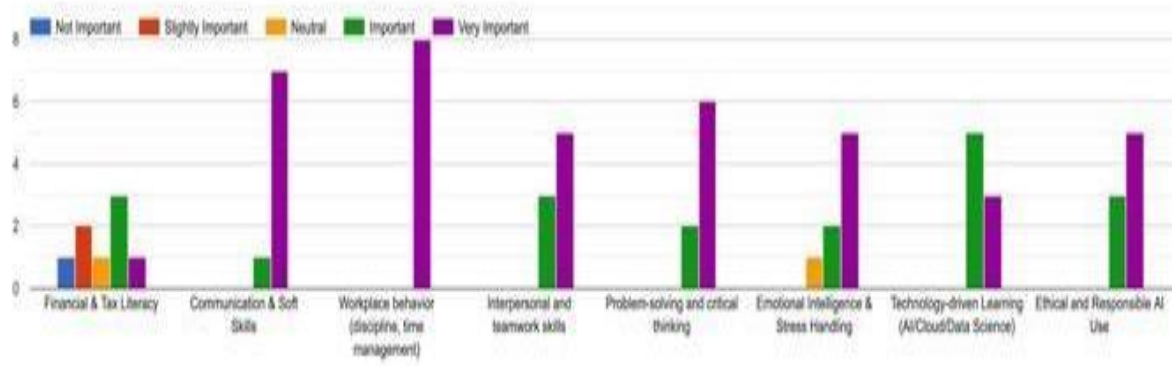

Figure 4.33 Skills Faculty Believe Need More Emphasis

"Skills Faculty Believe Need More Emphasis" chart in figure 4.33 highlights the skill areas that faculty believe should be prioritized in academic curricula.

Table 4.6 Skills Faculty Believe Need More Emphasis

Response Category	Financial & Tax Literacy	Communication & Soft Skills	Workplace Behaviour (Discipline, Time Mgmt)	Interpersonal & Teamwork Skills	Problem-solving & Critical Thinking	Emotional Intelligence & Stress Handling	Technology-driven Learning (AI/Cloud/Data Science)
Not Important	1	0	0	0	0	0	0
Slightly Important	2	0	0	0	0	0	0
Neutral	1	0	0	0	0	1	0
Important	3	1	0	3	2	2	5
Very Important	1	7	8	5	6	5	3

As seen in the graph, Workplace Behaviour (8 out of 8 respondents) including discipline and time management, without any opposition is highlighted as crucial for professionalism. Communication and soft skills (7 out of 8 respondents) follow as the second most necessary for effective interaction and growth.

Interpersonal and Teamwork Skills, Problem-Solving and Critical Thinking, Technology-driven Learning (MOOCs/Online Sources) and Ethical and Responsible AI Use have been identified as important and very important by the faculties. Emotional Intelligence and Stress Handling are identified as essential. While Financial & Tax Literacy has got mixed feedback.

Overall, the chart indicates the need for a balanced curriculum that integrates technical skills and essential non-technical skills to prepare students for the evolving job market.

Areas of Agreement and Disagreement

Comparison of student and faculty perceptions on the most important skills

Areas of Agreement

1. **Communication Skills**:
    - **Students**: Rated "Communication" the highest, with 159 out of 304 respondents giving it a score of “5” and 77 out of 304 respondents giving it a score of “4” .
    - **Faculty**: Ranked "Communication & Soft Skills" as “Very Important” (7 out of 8 respondents).

    Consensus: Both groups see communication as crucial for employability and success.
2. **Emotional Intelligence**:
    - **Students**: Moderate emphasis; most rated it between “3” and “5”, with 101 out of 304 respondents rating it “5”,106 out of 304 respondents rated it “4” and 66 out of 304 respondents rated it “3”.
    - Faculty: Considered “Very Important” by 5 out of 8 respondents and “Important” by 2 out of 8 respondents, especially for stress handling.

    Consensus: Recognized by both as a valuable personal and workplace skill.
3. **Team Collaboration / Interpersonal Skills**:
    - **Students**: Moderate support; 109 out of 304 respondents gave "Team Collaboration" a rating of 5, 106 out of 304 respondents rated it “4” and 61 out of 304 respondents rated it “3”.

- **Faculty**: Viewed “Interpersonal & Teamwork Skills” as “Very Important” by 5 out of 8 respondents and “Important” by 3 out of 8 respondents.

Consensus: Teamwork is acknowledged as key for modern work environments.

Areas of Disagreement

1. **Technical Skills vs. Workplace Behaviour**:
    - **Students**: Rated "Technical Skills" very highly (155 out of 304 respondents gave it 5).
    - **Faculty**: Gave higher priority to Workplace Behaviour (Discipline, Time Management), with all 8 faculty marking it as “very important”.

Mismatch: Students emphasize technical mastery, while faculty stress professional conduct and soft skills.

2. **Career Planning**:
    - **Students**: Consider it a top priority (highest score of 155 out of 304 respondents for rating 5).
    - **Faculty**: Not explicitly mentioned in faculty’s priority list.

Gap: Students are focused on navigating their future careers, while faculty may see it as beyond classroom responsibility.

3. **Financial Literacy**:
    - **Students**: Mixed views; 107 out of 304 respondents gave it “5”and 101 out of 304 respondents gave it “4”.
    - **Faculty**: Mixed; not seen as “Very Important” by most, with some even rating it “Neutral” or “Slightly Important”.

Mismatch: Students emphasis on the importance of Financial Literacy, while the faculty responses reflect a potential underestimation of practical life skills

Students' Perceived Level of Preparedness in Essential Skills

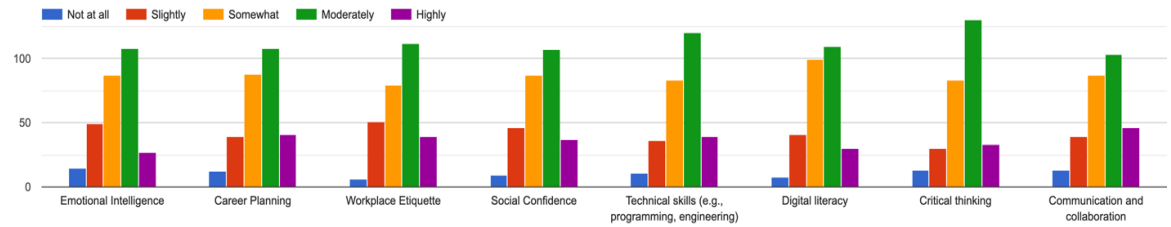

Figure 4.34 Level of Preparedness in Essential skills

The bar chart presents data on how prepared respondents feel for various essential skills. To determine the least prepared skills we will consider highest numbers in the "Not at all" "Slightly" and "Somewhat". The chart clearly shows that most respondents do not feel highly prepared in any of the life skills.

Table 4.7 Level of Preparedness in Essential skills

Response	Emotional Intelligence	Career Planning	Workplace Etiquette	Soft Skills and Communication	Technical Skills	Digital Literacy	Critical Thinking
Highly	27	41	39	37	39	30	33
Moderately	108	108	112	107	120	109	130
Slightly	49	39	51	46	36	41	30
Somewhat	87	88	79	87	83	99	83
Not at all	15	12	6	9	11	8	13

This data suggests the need for educational institutions to focus on giving extra attention in non-technical areas like emotional intelligence, career planning, and workplace etiquette while continuing to develop students' technical, critical thinking and communication skills**.**

Lacking in Common Skills as per the Faculty

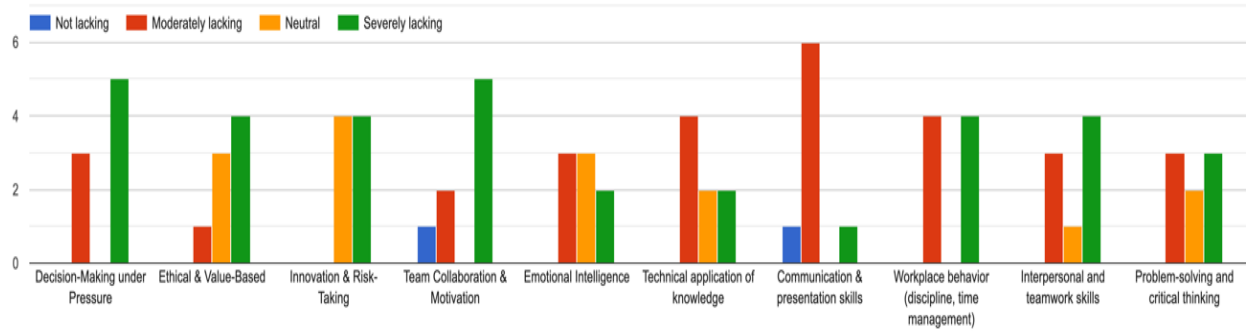

Figure 4.35 Lacking in Common Skills as per the Faculty

The chart in figure 4.35 provides insights into the skills faculty members believe are most commonly lacking in graduates.

Table 4.8 Lacking in Common Skills

Skill Area	Severely Lacking	Moderately Lacking	Neutral	Not Lacking
Decision-Making under Pressure	5	3	0	0
Ethical & Value-Based	4	1	3	0
Innovation & Risk-Taking	4	0	4	0
Team Collaboration & Motivation	5	2	0	1
Emotional Intelligence	2	3	3	0
Technical application of knowledge	2	4	2	0
Communication & presentation skills	1	6	0	1
Workplace behaviour (discipline, time management)	4	4	0	0
Interpersonal and teamwork skills	4	3	1	0
Problem-solving and critical thinking	3	3	2	0

The data highlights that many faculty members consider several essential skills severely lacking in graduates. These skills are likely critical areas for improvement in preparing students for the workforce. This resonates with the student's feedback on the skills they perceive missing.

This aligns with the faculty view on increased CSR funding, industry-aligned capstone projects, sponsoring student internships, establishing advanced labs and research centres, Organizing hackathons and industry-academia networking events and training faculty on

emerging technologies. Overall, initiatives offering direct, practical experience (industry projects and internships) are rated more favourable by the industry as well as the faculty, while those perceived as less hands-on or less relevant like certifications garner more mixed feedback.

Key Skills Industry Believes Lacking in Graduates

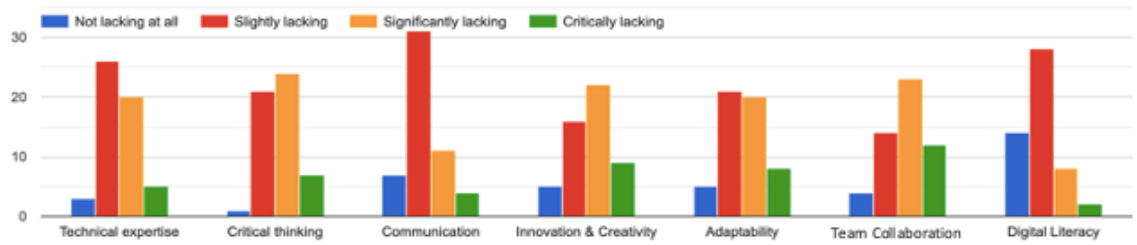

Figure 4.36 Key Skill Industry Believes Lacking in Graduates

The bar chart illustrates industry perception of the key skills that are most commonly perceived as lacking in fresh graduates. Leadership, Innovation & Creativity, Adaptability, and Critical Thinking are the skills most respondents identify as critically or significantly lacking.

Table 4.9 Key Skill Lacking in Graduates

Skill Category	Critically lacking	Significantly lacking	Slightly lacking	Not lacking at all	No response
Technical expertise	5	16	23	3	0
Critical thinking	7	20	19	0	1
Communication	4	10	28	4	1
Innovation & Creativity	9	20	13	4	1
Adaptability	8	18	16	5	0
Team Collaboration	11	21	12	2	1
Digital Literacy	2	7	26	11	1

Areas of Agreement and Disagreement

Comparison of student, faculty and industry perceptions on the most important skills

Areas of Agreement

1. **Soft Skills & Communication:**
    - Students feel underprepared; 37 out of 304 respondents rated themselves Highly prepared.
    - Faculty rate it as “moderately lacking”; 1 out of 8 respondents marked it “Severely lacking”, 6 out of 8 respondents Moderately lacking

- Industry lists it as significantly lacking with 4 out of 47 respondents stating it "Critically lacking", 10 out of 8 respondents saying "Significantly lacking"

All three groups (students, faculty, and industry) acknowledge a lack in communication and interpersonal abilities.

2. **Critical Thinking and Problem Solving**
    - Students feel only moderately prepared. Only 33 out of 304 respondents rated themselves "Highly prepared", 130 out of 304 respondents reported "Moderately Prepared".
    - Faculty rate critical thinking as lacking with 3 out of 8 respondents marked it "Severely lacking", 3 out of 8 respondents saying "Moderately lacking"
    - Industry lists Critical Thinking as significantly lacking with 7 out of 47 respondents stating "Critically lacking", 20 out of 47 respondents stating "Significantly lacking" and 20 out of 47 respondents stating "Slightly lacking"

Student, faculty and industry, all strongly rate Critical Thinking and Problem Solving as lacking.

3. **Teamwork & Collaboration**
    - Students don't directly report on it, but related soft skills and Workplace Etiquette are marked low.
    - Faculty rated "Interpersonal and teamwork skills" as lacking with 4 out of 8 respondents marked it "Severely lacking", 3 out of 8 respondents saying "Moderately lacking"

- Industry lists Team Collaboration as significantly lacking with 11 out of 47 respondents stating “Critically lacking”, 21 out of 47 respondents stating “Significantly lacking” and 12 out of 47 respondents stating “Slightly lacking”

All three stake holders agree on poor team collaboration

4. **Digital Literacy**
    - Students feel moderately confident, 30 out of 304 respondents rated themselves “Highly prepared”, 109 out of 304 respondents reported “Moderately Prepared” 99 out of 304 respondents said “Somewhat”
    - Faculty didn’t mention it.
    - Industry, believes it “Slightly lacking” with 26 out of 47 respondents, and 7 out of 47 respondents “Significantly lacking” and only 2 out of 47 respondents stating “Critically lacking”

Areas of Disagreement

1. **Technical Skills**
    - Students show moderate preparedness. 39 out of 304 respondents rated themselves “Highly prepared”, 120 out of 304 respondents reported “Moderately Prepared”.
    - Faculty rated “Technical application of knowledge” as lacking with 2 out of 8 respondents marked it “Severely lacking”, 4 out of 8 respondents saying “Moderately lacking”

- Industry rated “Technical expertise” as “Critically lacking” by 5 out of 47 respondents, “Significantly lacking” by 16 out of 47 respondents and “Slightly lacking” by 23 out of 47 respondents

Students feel moderately prepared, while faculty and industry report notable gaps in practical application and depth of expertise.

2. **Innovation & Creativity**
    - Faculty rated “Innovation & Risk-Taking” as lacking with 4 out of 8 respondents marked it “Severely lacking”, 4 out of 8 respondents saying “Neutral”
    - Industry rated “Innovation & Creativity” as “Critically lacking” by 9 out of 47 respondents, “Significantly lacking” by 20 out of 47 respondents and “Slightly lacking” by 13 out of 47 respondents

Faculty and Industry both rate it critically lacking, showing a disconnect between self-perception and external expectations.

3. **Emotional Intelligence**
    - Students feel underprepared, with Only 27 out of 304 respondents feeling “Highly prepared” 108 out of 304 respondents feeling “Moderately prepared”, 87 out of 304 respondents feeling “Somewhat”
    - Faculty has a mixed review with 2 out of 8 respondents marked it “Severely lacking”, 3 out of 8 respondents saying “Moderately lacking” and 3 out of 8 respondents saying “Neutral”

Findings for RQ5. What gaps are identified in secondary sources between academic preparation and real-world skill expectations for students, recent graduates, and educators?

The RQ5 reflects the process of identifying key themes, sub-themes, codes and descriptions from the content analysis of qualitative data related to career readiness, educational reform, and industry-academic alignment. From this process, seven key themes and 20 sub-themes emerged. Also, 37 codes were identified. These themes were used to develop a case description that answered the research questions. Table 4.10 shows the process of identifying key themes, sub-themes, codes, and descriptions from the content analysis of qualitative data.

This table presents key themes, sub-themes, codes, and descriptions from the content analysis of qualitative data related to career readiness, educational reform, and industry-academic alignment.

Table 4.10 Key themes, sub-themes, codes, and descriptions from the content analysis of qualitative data

Theme	Sub-Theme	Code	Description
Bridging Strategies and Recommendations	Career Readiness	Career readiness modules	Job prep sessions, mock interviews, resume help
	Industry Collaboration	Industry-academia partnerships	More collaboration for curriculum design and training
	Curriculum Design	Curriculum co-creation	Courses built with input from

			employers or alumni
	Faculty Training	Faculty development programs	Training for educators on industry trends and tools
	Work Experience	Mandatory internships	Real-world exposure embedded in programs
	CSR Support	CSR for academic reform	Corporate funds support academic excellence
	Digital Infrastructure	Digital and hybrid learning	Flexible models, online certifications, MOOCs
	Skills Integration	Soft skills integration	Communication and teamwork taught explicitly
Culturally Rooted Education	Traditional Knowledge	Empowering traditional vocations	Integrating traditional vocations with

			digital tools and entrepreneurship
	Cultural Sensitivity	Local and cultural integration	Education must reflect and respect cultural/linguistic diversity
	Personalization	Multidisciplinary education	Need for interdisciplinary, locally relevant, personalized models
Educator Perspectives and Limitations	Faculty Challenges	Faculty overload	Teaching is hindered by non-teaching duties
		Operational workload	Admin tasks, documentation, multiple roles
		Syllabus lag	Delayed curriculum reform makes programs obsolete
		Talent drains in academia	High performers prefer industry to academia

		Lack of training/upskilling	Instructors not equipped to teach modern tools
		Limited industry exposure	Faculty unfamiliar with workplace practices
		Resistance to change	Institutional inertia, slow to adopt new pedagogy
Industry Expectations and Feedback	Mindset	Adaptability and learning mindset	Continuous upskilling is expected in fast-changing fields
	Skills Gap	Need for problem-solvers	Employers want analytical and critical thinking skills
		Teamwork and self-motivation	Independent, proactive, collaborative workers
		Tool/software proficiency	Domain-specific tool skills expected

		Focus on grades over skills	Tests dominate over employability focus
Misalignment Between Academic Curriculum and Industry Needs	Soft Skills Gap	Insufficient soft skills	Communication and teamwork underemphasized
	Technical Preparedness	Minimal exposure to tools	Students unfamiliar with industry tools
	Practical Application	Lack of practical application	Few real-world experiences in curriculum
	Curriculum Gaps	Outdated syllabus	Content does not match industry practices
		Theoretical overload	Excessive focus on abstract or rote learning
Perceived Value of Academic Education	Academic vs. Applied	Academic foundation is valuable	Basics still useful
		Degree ≠ job readiness	Degree doesn't ensure capability

		Desire for applied learning	Preference for experiential learning
		Real learning on the job	Belief most learning happens at work
		Lifelong curiosity	Continuous growth mindset needed
Student and Fresher Readiness	Confidence and Skills	Inadequate internship opportunities	Lack of work experience pre-graduation
		Lack of hands-on experience	Limited chance to build portfolios
		Low confidence	Anxiety and unpreparedness for work
		Poor communication skills	Struggles in expressing ideas in interviews or teams
		Study-to-work transition issues	Difficulty adjusting to workplace culture

In the data analysis process, the quotations were used from multiple sources (semi-structured interviews and content analysis of the secondary sources). These data sources were triangulated to ensure there was a convergence of the evidence within each of the themes (Yin, 2009).

In summary, the perceived gaps between academic preparation and real-world skill expectations stem from systemic, cultural, and structural challenges within the education ecosystem.

4.4 Conclusion

This study highlights the significant gap between academic preparation and real-world skill expectations, as expressed by students, fresh graduates, faculty, and industry professionals. While students value the academic knowledge they have gained, they feel under prepared for practical application, critical thinking, problem solving, career planning, and workplace etiquette. Faculty face administrative burdens, outdated curricula, and limited industry collaboration, impacting their ability to provide relevant instruction. Industry representatives report that graduates often lack practical experience, soft skills, and technical competencies, requiring extensive retraining.

CHAPTER V:
DISCUSSION, IMPLICATIONS, RECOMMENDATIONS AND CONCLUSIONS

5.1 Introduction

In this section, the main findings from the research are discussed in relation to the research questions posed at the start of the study. The findings take a detailed look at how well academic preparation matches up with what employers expect, especially in the IT sector. This chapter will critically analyse the data and give insights into the views of students, course coordinators/educators/faculties, industry and experts on the issue of employability skills and the gap between education and what employers want.

This section will also look at how the data collected answers each of the research questions (RQ1, RQ2, RQ3, RQ4, and RQ5). It will focus on the different views of students, course coordinators/educators/faculties, and industry. The discussion will explore possible reasons for these gaps, such as faculty workload, outdated curricula, lack of industry engagement and the fact that students don't get enough real-world experience during their academic training.

5.2 Discussion of findings

The goal of this mixed-method study was to examine how reforms to education and employment, as well as policy changes, can contribute to empowering IT graduates with skills that employers seek. This section contains discussion of the findings from 304 engineering graduates, 47 industry participants and 8 course coordinators/educators/faculties from different universities.

Discussion of findings for RQ1. How do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment?

The findings in response to Research Question 1 (RQ1), which explored how effectively students believe their educational experiences have prepared them for employment, reveal a nuanced and mixed perspective. A notable 64% of respondents indicated that the most significant gap between their academic preparation and the expectations of employers stems from a lack of hands-on experience and opportunities for practical application of their knowledge. This highlights a critical deficiency in experiential learning opportunities and indicates insufficient incorporation of real-world scenarios into the curriculum across various disciplines.

Students reported being exposed to abundance of theoretical knowledge; however, many expressed unpreparedness when applying this knowledge into practical, real-world work environments. This disconnect is particularly pronounced in fields such as software development and engineering, where the ability to apply technical skills in real-life situations is essential for success.

Students expressed moderate satisfaction with the skill development opportunities provided by internships, academic projects, and extracurricular activities. However, many respondents believed that these opportunities were often limited in scope and inadequately aligned with current industry-specific demands and trends. This suggests a more extensive systemic issue within academic institutions, which may not fully collaborate with industry stakeholders to ensure students obtain the essential exposure and training required for a successful transition into the workforce. Bridging this gap is vital for enhancing employability

and ensuring graduates are adequately prepared to meet the challenges of their chosen professions.

Interpretation of Results

1. Preparedness for First job

The data suggests that most students perceive themselves as Somewhat prepared across a broad spectrum of essential skills, reflecting a prevalent sense of under preparedness. This finding emphasizes the necessity for enhanced educational strategies to elevate students' basic competence to higher proficiency levels. This suggests that although students possess certain foundational skills, they typically exhibit limited confidence and proficiency.

2. Value that Students Assign to Academic Knowledge

The data suggests that while a significant portion of students appreciate academic knowledge to a moderate extent, few students place a high level of importance on it. This moderate valuation might indicate that students recognize academic knowledge as useful but possibly view it as insufficient for their career and personal growth. The relatively low number of students who rated academic knowledge as "Not at all" valuable shows that academic learning is still considered relevant by most respondents, but the spread also hints at potential gaps in how academic knowledge aligns with practical or employability expectations. This highlights the necessity for educational institutions to assess and enhance the relevance of academic content to equip students for real-world challenges.

3. Should Schools Teach Emotional and Mental Health Skills

The overwhelming support shown by respondents highlights a strong consensus on the importance of integrating emotional and mental health skills into school curricula. This suggests that students recognize the value of equipping themselves with the tools to manage emotional

and psychological challenges, which can contribute to better mental well-being and resilience throughout life. The relatively low proportion of disagreement indicates minimal resistance to this idea, reflecting a growing awareness of mental health issues and their impact on academic performance and personal development. Overall, the findings suggest the need to embed emotional and mental health education within school programs to promote holistic student development.

4. Satisfaction with opportunities to develop Practical Skills other than academic theory

The data shows that a majority of respondents hold a positive view of the opportunities available to develop practical skills, as almost 60% are either satisfied or very satisfied. This means that institutions are somewhat successful in providing practical learning experiences that complement theoretical knowledge.

The sizable neutral group (34.2%) suggests a considerable room for improvement. To enhance technical skills, educational institutions could focus on initiatives that enhance practical skills, such as coding competitions, internships, case studies, live projects, etc. These improvements would support better preparation for real-world challenges and workforce readiness.

4. Most Important Skills Today for the Youth

The data indicates that respondents believe "Career Planning," "Communication and Collaboration," and "Technical Skills" as the most important skills for success in today's world. This highlights the perceived need for both effective interpersonal and technical competencies. The strong emphasis on "Communication and Collaboration" highlights the importance of teamwork and social interaction in today's workplace. Additionally, the high ratings for

“Technical skills” reflect the increasing demand for proficiency in technology related domains, aligning with trends in the global digital market.

While "Social Confidence" is also highly valued, their slightly lower ratings suggest they are seen as important but perhaps secondary to core career and technical skills. The moderate ratings for “Digital Literacy”, "Financial Literacy," "Emotional Intelligence," and "Workplace Etiquette" show recognition of their significance, though they might be considered supplementary skills.

Overall, the graph demonstrates a broad consensus on the multifaceted skill set required for youth today, combining technical knowledge, interpersonal abilities, and proactive career management. This shows that there is a need for educational and training programs to focus on developing all of these skills in order to prepare youth for the challenges of the modern workforce.

5. **Performance Vs. 100% Effort**

This graph shows that putting in more effort is linked to better performance ("Excellent"). Even though the "Excellent" group is the smallest, 60% of the people in it say they put in "100% effort," which suggests that effort is strongly linked to better academic results. The "Good" performance group, although larger, has an equal number of people putting in and not putting in effort, which suggests that other factors may also affect performance. The "Average" group, on the other hand, has more people putting in less effort, which may be attributed to their relatively lower academic achievement. Overall, the data supports the idea that consistent effort is important for getting better academic results and suggests that motivating students could be the key to improving results across all performance levels

6. **Priorities in the Job Market vs. Interest in Engineering**

This analysis sought to ascertain whether students' interest in pursuing engineering careers affected their perceptions of job market readiness priorities. Notably, the results reveal that students' career interests exerted negligible influence on their perspectives—both groups (those inclined and disinclined towards engineering) recognized similar priorities. This uniformity indicates that students, irrespective of their disciplinary preferences, are increasingly aware of the demands of the job market and are collectively seeking more application-based, experiential, and real-world learning opportunities.

7. Belief in Continual Learning

The aim of the graph is to determine whether their education has instilled in them the importance of Continual Learning. The data clearly shows a strong consensus among respondents supporting the concept of continual learning, recognising lifelong learning as a critical component for personal and professional growth, especially relevant in fast-evolving fields such as Information Technology. The near-unanimous endorsement reflects an understanding that continuous skill development and knowledge acquisition are necessary to remain competitive and adaptable in today’s dynamic job market.

8. Students Encouraged to Develop Hobbies and Creative Interests

The data shows that most students receive at least some level of encouragement to pursue hobbies and creative interests, with more than three-quarters feeling either strongly or somewhat supported. This reflects a generally positive environment for promoting creativity and personal development beyond academics. However, the fact that almost 23% of students say they rarely or never got support shows that there is room for improvement. Educational institutions may need to strengthen initiatives and programs that encourage creative activities, which can lower stress and help holistic student development, leading to better professional and personal outcomes.

9. Student's feedback on Familiarity with the Corporate Workspace

The findings suggest that while a majority of students (nearly 90%) have at least some degree of familiarity with the corporate workspace, there remains a notable gap in full readiness. The high percentage of "Somewhat" responses implies that many students may have limited or superficial exposure.

This highlights a need for stronger industry-academia collaboration, including Internships, Industry visits, Capstone projects with corporate partners and Mentorship programs. These kinds of programs can help students bridge the gap between what they learn in educational institutes and what businesses expect, making sure they gain not only knowledge but also confidence and skills in dealing with professional situations.

10. Learning to Deal with Different Behaviour

The data indicates a critical gap in emotional education A considerable majority—65.1% (198 out of 304)—responded that they have had to learn to manage emotions like anger, frustration, or fear on their own, without formal training. This highlights a systemic shortfall of structured emotional training within educational settings.

Only 17.4% (53 students) received structured training, indicating that formal emotional resilience programs are not prioritized. The significant number, 15.5% (47 students) of respondents who want to learn but have not yet done so points to an inadequately met demand

Lack of coping mechanism leads to stress, burnout, interpersonal conflict, or even poor performance in high-pressure professional environments. In contrast, structured emotional learning can foster Resilience, Improved communication, Better teamwork and Greater leadership potential

The findings strongly advocate for the integration of emotional intelligence and well-being programs into the curriculum. Institutions should consider incorporating, Workshops on emotional regulation, Counselling support, Mindfulness practices and Peer-led sharing circles

Such initiatives would not only support students' mental well-being but also align with industry expectations for emotionally intelligent, adaptable, and self-aware professionals.

11. Students' View About the Gap between Academia and Industry Expectation

The data highlights that the predominant factor contributing to the disconnect between academic training and industry needs is the insufficient practical experience and hands-on exposure provided by academic programs as pointed out by 56.7% (159 out of 304 respondents).

Additional gaps reported include Lack of exposure to industry-specific tools and technologies (14.5%), Insufficient focus on soft skills like teamwork and communication (12.4%), Limited development of critical thinking and problem-solving abilities (7%) and Outdated technical knowledge (6%).

These insights can serve as very useful guidelines for curriculum design. Students are signalling the importance of more internships, project-based learning, live industry projects and lab-based instruction that simulate real world scenarios. A notable number of students feel unprepared to use industry-standard tools, indicating the need for continuous curriculum updates in line with current industry practices. Although not rated as the topmost gap, the significant percentages still reflect a shortfall in Soft skills and critical thinking (interpersonal and cognitive skill development) both of which are valued by employers.

12. Inclusion of Key Employability skills in Academic curriculum

The findings reinforce an academic bias toward theory based instruction, with limited attention to practical and soft skills. The responses clearly indicate a lack of depth and

consistency in key employability skills, particularly in Soft Skills where only 23 of 304 students felt these were covered in depth, Project-Based Learning where only 22 of 304 students rated as deeply covered, Critical Thinking where only 26 of 304 students rated as deeply covered, Industry-Related Knowledge only 22 of 304 students rated as deeply covered and Financial Literacy received the weakest scores overall. This suggests actual implementation remains surface-level despite curriculum designers acknowledging employability skills in policy.

Discussion of findings RQ2. What challenges do faculty members identify in aligning the curriculum with evolving industry requirements and in ensuring effective skill delivery?

Faculty members face significant challenges in aligning the curriculum with ever changing industry needs and ensuring the delivery of relevant skills. One of the primary obstacles is an already packed curriculum, which makes it difficult to add life skills program. There is a lack of appreciation for the importance of life skills amongst key stakeholders, makes their integration difficult. Another layer of complexity is added due to dearth of trained faculty and the necessary resources.

The findings indicate that these educators face significant obstacles primarily due to an overwhelming administrative workload, including accreditation reporting and compliance tasks. Many faculty members in engineering colleges are confronted with countless additional responsibilities that extend beyond classroom instruction. These include preparing extensive documentation for certifications from organizations such as the National Assessment and Accreditation Council (NAAC) or the All-India Council for Technical Education (AICTE) and navigating the complexities of new accreditation processes that emerge annually. Such

administrative tasks, drastically limit the time available for curriculum development and engage with current industry trends.

Furthermore, the data reveals a critical challenge stemming from a lack of industry exposure among faculty members, compounded by insufficient funding for their professional development. Faculty participants in the study expressed concern over the scarcity of opportunities available for continuing education, networking, and skill enhancement that would enable them to remain competitive within their fields. Many noted, that remain updated with latest industry innovations and practices without adequate resources or financial support becomes increasingly tricky. This issue is exacerbated by the absence of incentives that could motivate faculty to pursue industry collaborations, sabbaticals focused on gaining practical experience or opportunities for specialized training within industry settings.

The qualitative data also revealed a certain degree of resistance to change among some faculty members. This resistance stems from both personal and institutional factors. On a personal level, some faculty members feel comfortable with traditional teaching methods and are hesitant to adopt new approaches or technologies. On an institutional level, some universities lack the flexibility to implement rapid changes in curriculum due to bureaucratic hurdles, fixed academic practices, limited manpower, etc. This resistance to change can impede the efforts to update the curriculum and better align it with industry requirements.

This situation underscores a fundamental disconnect between academia and industry, which ultimately constrains the faculty's capacity to impart knowledge and skills directly aligned with contemporary industry needs. The gap in support and resources, hinders faculty development and undermines the overall educational quality students receive, as it limits the

integration of real-world applications into the curriculum. Addressing these challenges is crucial to ensuring that graduates are adequately prepared to meet the demands of the workforce.

High level of qualification of the responding course coordinators/educators/faculties suggests that they are well-prepared to contribute to research and curriculum development. Moreover, faculty members emphasize the importance of academic autonomy, which allows them greater flexibility to adapt the syllabus to incorporate current industry trends and demands. Regular interactions with industry professionals are essential to stay updated with the latest industry developments and ensure that the curriculum remains relevant. Faculty upskilling and better infrastructure, such as high-tech laboratories and advanced facilities, are key to bridging the gap between academia and industry.

5.1 Faculty Curriculum Alignment

Interpretation of Results

Ways in Which Faculty Upgrade Themselves

The data shows that *self-learning through online courses* is the most consistently used method of professional upgradation. 7 of 8 faculty members indicating “Always” suggests a high level of individual motivation and comfort with online platforms for gaining new knowledge and

skills. This aligns with the increasing availability of Massive Open Online Courses (MOOCs) and certifications offering flexibility and up-to-date content.

The responses indicated moderate engagement in “Attending workshops and conferences”, “Engaging in research and development” and “Collaborating with industry experts”. This is due to logistical challenges (travel, funding, time constraints), lack of institutional incentives and structured support, and varying levels of interest or alignment with faculty roles.

Inclination towards Reading Academic Papers and Industry Reports is least due Difficulty accessing quality journals, time constraints, lack of habit and preference for more interactive learning methods

Biggest Challenges Faced in Staying Updated with IT Trends

The responses, measured on a 5-point Likert scale, provide a clear overview of the challenges faced by the faculty members in keeping up with the rapid developments in the IT domain. It highlighted a strong awareness among educators about the structural and practical barriers that limit professional growth and knowledge renewal.

The findings identified institutional constraints—such as rigid curricula, inadequate funding, and bureaucratic hurdles—as the most pressing challenge. This finding highlights the systemic limitations that restrict agility in curriculum updates, adoption of new technologies, and faculty access to resources. It points to a need for policy-level reform and greater autonomy in academic program design.

“Lack of time for self-learning” was also rated highly by 5 of 8 respondents as “Important” and 2 of 8 respondents as “Very Important”, indicating that even though faculty members are willing to learn, competing responsibilities like teaching loads, administrative

duties, and student mentoring often hinder continuous learning. This implies that workload redistribution or designated self-learning hours could be beneficial.

The lack of institutional support for faculty development initiatives, such as training, sabbaticals, or sponsored certifications, was another major concern. This calls for mechanisms for upskilling educators, calling for dedicated development budgets, structured programs, and incentives

Though not ranked the highest, “Limited Access to Updated Teaching Materials” received mixed reviews. Faculty members need timely, updated resources aligned with industry expectations. Lack of access could stem from outdated syllabi, limited subscriptions or insufficient digital infrastructure.

With the ever-evolving nature of IT, rapid obsolescence of knowledge is a critical but slightly less emphasized issue. Leadership must recognize and act upon the structural limitations that inhibit innovation and skill development. Empowering educators directly enhances the quality of student learning and the employability of graduates.

Digital Tools Used by Faculty

The data suggests that Learning Management Systems are universally adopted by faculty, reflecting their fundamental role in delivering course content and managing academic activities. The consistent high usage indicates LMS platforms are integral to faculty workflows.

Cloud-based Collaboration Tools and Coding Platforms are widely used but show some variability, indicating differing levels of integration into teaching practices or research activities. The presence of "Rarely" users may point to barriers such as lack of familiarity, access issues, or perceived relevance, highlighting potential areas for faculty development and support.

The more dispersed usage of Diagramming Applications and Virtual Labs & Simulators indicates these tools are less uniformly embedded in teaching methods. The presence of "Never" responses for these tools suggests some faculty do not incorporate these technologies, potentially due to lack of training, resource availability, or subject-specific applicability.

Overall, the findings highlight a strong reliance on core digital platforms like LMS, while more specialized tools have varied adoption rates. This emphasizes the need for targeted initiatives to enhance faculty familiarity and integration of diverse digital resources to enrich pedagogical effectiveness and student engagement. Institutions should offer targeted training to encourage the effective use of underutilized tools, especially diagramming applications and virtual labs, which can significantly enrich student learning. Incorporating the use of coding and collaboration tools into course objectives can enhance students' digital fluency and readiness for industry roles.

New IT Technologies Recently Introduced to Students

The results offer insightful trends about curricular alignment with evolving industry demands. Artificial Intelligence & Machine Learning stand out as the most frequently introduced topics, with 87.5% of educators reporting its inclusion. This reflects a strong recognition of AI/ML's central role in modern IT ecosystems, spanning applications from automation and data processing to predictive analytics and smart systems. Its dominance suggests that institutions are actively adapting curricula to prepare students for high-demand, future-ready roles.

Cloud Computing, Cybersecurity, Data Science & Analytics, Internet of Things (IoT), DevOps & Agile Methodologies were introduced by **62.5%** of the respondents. Such wide adoption indicates that educators are successfully aligning curricula with industry skills frameworks.

Blockchain was introduced by 37.5% of faculty, suggesting growing but cautious adoption. Its lower frequency stems from factors like, lack of standardized teaching content, limited real-world application familiarity among faculty and Perception of it as a niche area.

Dynamic Programming, a fundamental problem-solving technique in algorithmic thinking, was introduced by only 12.5% of respondents. This is noteworthy given its foundational value in Competitive programming, Coding interviews and Algorithmic skill development. Its low emphasis indicate a shift toward application-oriented domains over theoretical rigor. While aligning with industry trends is crucial, educators must also maintain balance with core computer science concepts to ensure long-term problem-solving competence.

Teaching Strategies Adopted by Faculty to Enhance Student Engagement

The data reveals strong alignment with modern pedagogical trends that emphasize active learning, experiential methods, and industry integration. The most widely adopted strategy is hands-on lab sessions, reported by 87.5% of respondents (7 out of 8). This Promotes problem-solving and critical thinking through direct experimentation, bridges the gap between concept and application, is effective in technology-driven domains like programming, networking, cybersecurity, and AI.

Project-based learning and interactive learning tools are each used by 75% of respondents (6 out of 8). This reflects a commitment to student-centred pedagogy, where learners take ownership of outcomes, developing soft skills like collaboration, time management, and communication, enhancing engagement through gamification, simulations, and digital platforms.

Industry case studies were utilized by 62.5% of educators (5 out of 8), indicating a moderate yet important emphasis on contextualized learning. Case studies help students relate

theory to industry practice, encourage analytical thinking and strategic decision-making. While slightly less adopted than other strategies, case studies remain a vital tool for infusing relevance and practicality into academic content.

Methods Used by Educators to Assess Students' Industry Readiness

The data from 8 educators on the tools and techniques they employ to assess students' preparedness for industry, reveals a strong emphasis on technical competence and experiential exposure, while soft skills assessment remains comparatively underutilized.

All respondents (100%) reported using technical assessments and internship/project collaboration as key indicators of industry readiness. This reflects a shared belief among educators that Core technical skills form the foundation for employability in IT and engineering sectors while Internships and projects provide students with exposure to real-world challenges, workplace culture, and teamwork. These two assessment strategies indicate an effective integration of academic performance and experiential learning.

A substantial number of educators (6 out of 8, or 75%) also use practical project evaluation, reinforcing the trend toward hands-on and output-based learning assessment. This works as a framework where students are evaluated not only on what they know but on what they can build and deliver.

Despite being critical for employability, soft skills assessment was reported by only 4 respondents (50%). This highlights a potential gap in holistic evaluation. The lower adoption is due to lack of standard tools to evaluate soft skills, subjectivity in assessment and time constraints in curriculum.

One respondent (12.5%) stated that industry readiness is difficult to assess as capturing intangible competencies like attitude, motivation, and initiative is very subjectivity. This highlights the need for multi-dimensional assessment models that are both rigorous and adaptable, Aligning educational outcomes with diverse industry expectations.

Discussion of findings for RQ3. What key skills and competencies needed for successful employment in today's job market are lacking?

Preparedness of Fresh Graduates for Roles in Terms of Technical Skills

The data highlights a major concern from the industry perspective regarding the technical preparedness of fresh graduates. A majority of 61.1% of industry professionals perceive graduates as only "somewhat prepared," which suggests that while foundational knowledge may be present, there is a wide gap in hands-on technical experience , real-world problem-solving and applied skills.

This indicates that graduates are not industry-ready on completion of their academic programs, requiring additional training before they can contribute effectively. The need to realign academic curricula with current industry requirements is further emphasised by the fact that 20.4% of respondents believe graduates are "not prepared". This group suggest graduates lack even the basic competencies expected at entry-level positions.

Notably, 18.5% of the respondents feel that although graduates are technically prepared, they lack confidence. This lack of self-confidence arises from limited exposure to industry environments, inadequate practical experiences and insufficient opportunities to apply their skills in real-world scenarios. It calls for an intervention, such as internships, mentorship programs and simulated project environments, to bridge the confidence gap.

Rating of Fresh Graduates for Soft Skills

The data indicates 67.9% of respondents demonstrate “average” soft skills, suggesting that while graduates possess basic interpersonal and communication abilities, there is considerable room for improvement. The 17% percentage of "Weak" and 3.8% of "Very Weak" ratings highlights a significant deficiencies in core behavioural traits such as adaptability, teamwork, leadership, emotional intelligence and collaboration. that could affect their effectiveness in professional environments.

Notably, no respondents rated graduates' soft skills as “excellent,” and only 11.3% rated them as “good.” This underlines a pronounced skills gap and missed opportunities to develop well-rounded professionals.

These findings suggest that academic programs need to place greater emphasis on cultivating strong soft skills through targeted training, curricular Integration, career readiness workshops, industry engagement and experiential learning to better prepare graduates in team collaboration and presentation.

Alignment of Academic Curriculum with Industry needs

The data suggests that while there is some level of alignment between academic curricula and industry expectations, it is generally partial and insufficient. The majority view that the curriculum is "Somewhat Aligned" or "Aligned but needs improvement" reflects recognition of existing efforts but also highlights significant gaps that need addressing. The substantial proportion of respondents who perceive the curriculum as "Not Aligned" signals critical misalignments that may contribute to graduates' unpreparedness for real-world challenges. The minimal percentage of "Highly Aligned" responses underscores the need for stronger collaboration between academia and industry to ensure curricula are updated and relevant.

Collaboration for Academic Developments

The data reveals a predominant perception of insufficient collaboration in academic development activities, with over half of the respondents indicating that such partnerships are lacking. This suggests potential disconnects between academic institutions and relevant external stakeholders, which may hinder curriculum modernization, resource sharing, and practical learning opportunities. The 32.7% who acknowledged collaboration indicates that some efforts are underway, but these may not be widespread or consistently effective. Overall, these findings emphasize the need to strengthen and expand collaboration frameworks to enhance academic quality and better align educational outcomes with industry and societal needs.

Effectiveness of the Industry-Academia Initiatives

Industry-driven projects are perceived as the most effective industry-academia initiative, receiving the highest count of “Very Effective” and “Effective” ratings with minimal neutrality or dissatisfaction. This suggests that Industry-driven projects provide meaningful, practical exposure that is highly valued by respondents.

Similarly, Internships are viewed positively with a strong majority rating them as “Very Effective” or “Effective”, indicating their relevance in fostering practical skills aligned with industry needs.

In contrast, Faculty training by industry experts has a more mixed perception, with increased “Neutral” and a few “Ineffective” responses, suggesting variability in how this initiative is delivered or perceived. This could imply inconsistent quality or limited direct benefits perceived by participants.

Certification programs receive the least favourable evaluation, with low “Very Effective” ratings and comparatively high “Neutral” and “Ineffective” responses. This suggests that

certification programs may not be meeting expectations or may lack sufficient practical impact, indicating a need for review or enhancement to increase their effectiveness.

Overall, initiatives offering direct, practical experience (industry projects and internships) are rated more favourably, while those perceived as less hands-on or less relevant (faculty training and certifications) garner more mixed or negative feedback.

Industry professionals overwhelmingly resonate with the concerns expressed by students and faculty regarding the essential preparedness of graduates entering the workforce. A striking 56.7% of industry respondents pinpointed the absence of hands-on experience and practical application as the most critical shortcoming in graduate readiness. They emphasized that while many graduates possess theoretical knowledge, they often find themselves ill-equipped to navigate the real-world challenges that arise in professional settings, particularly in domains that demand problem-solving and critical thinking abilities.

Moreover, industry representatives underscored the vital need for technical upskilling in today's rapidly evolving job market. They noted that companies frequently need to invest substantial time and resources to train newly hired graduates in industry-specific tools and technologies, which can be a daunting task considering the fast pace of innovation.

In addition to technical competencies, the importance of soft skills emerged as a significant theme, with numerous employers expressing concern about graduates' deficiencies in crucial interpersonal and communication abilities. While technical skills undoubtedly hold weight, the capability to articulate ideas effectively, collaborate seamlessly within teams, and adeptly tackle problems under pressure is equally essential for thriving in a dynamic workplace environment.

Discussion of findings for RQ4. To what extent do students, freshers, faculty members and industry agree on the key skills and essential competencies for successful employment in today's job market?

RQ4 explored the extent to which students, fresh graduates, faculty members, and industry professionals agree on the key skills and essential competencies for successful employment in today's job market. The analysis revealed areas of convergence as well as significant divergences in perceptions.

Areas of Agreement

A strong consensus was observed around the importance of communication and collaboration skills. Students rated these skills highly (with 159 out of 304 giving a 5/5), and faculty similarly emphasized their necessity, with 7 of 8 respondents rating them as "Very Important." Industry feedback echoed this sentiment, identifying communication as a commonly lacking yet essential employability trait. This triangulation reflects a shared understanding of its significance in professional success.

Problem-solving and critical thinking also saw wide recognition. Faculty identified this as a vital skill needing more curricular emphasis. Industry professionals rated critical thinking among the most critically or significantly lacking skills in graduates. While students rated it somewhat lower than technical competencies, the combined faculty and industry concern highlights a pressing need for improved training in analytical reasoning and decision-making.

Furthermore, emotional intelligence and workplace behaviour received cross-stakeholder acknowledgement. A majority of students conveyed attempting to learn emotional coping strategies independently, whereas faculty highlighted the importance of structured training in

emotional intelligence and professionalism. Industry responses aligned with this, identifying deficiencies in areas like discipline, stress handling, and interpersonal conduct.

Areas of Disagreement

While there is general agreement among students, faculty, and industry on the importance of core employability skills such as communication, critical thinking, and emotional intelligence, several notable disagreements emerged regarding other key competencies.

One of the most pronounced differences lies in the perception of technical skill readiness. Students overwhelmingly rated their technical skills highly, suggesting a strong belief in their preparedness. However, faculty members reported concerns about students' ability to apply theoretical knowledge in practical settings. This concern was echoed by industry professionals, who indicated that while graduates may possess technical knowledge, their capacity to use it effectively in real-world tasks remains limited. This discrepancy reveals a potential overconfidence among students and highlights a critical gap in application-oriented learning.

Another area of divergence concerns leadership, innovation, and adaptability. These were among the most critically lacking skills identified by industry respondents, with soft skills in particular receiving the highest "critically lacking" ratings. Yet, students and faculty placed considerably less emphasis on these competencies. This points to a misalignment between academic priorities and the dynamic demands, where adaptability, creativity, and leadership are essential for navigating complex, rapidly changing environments.

Disagreement also surfaced regarding digital literacy. Students generally rated themselves as competent in this area, likely reflecting familiarity with basic digital tools and platforms. However, industry responses suggested that graduates often lack the advanced digital capabilities required in the workplace, such as data analysis, cybersecurity, and cloud-based

technologies. This indicates a gap in the depth of digital proficiency being cultivated through academic programs.

A similar disconnect was observed in the case of financial and tax literacy. This competency received relatively low emphasis from both students and faculty, despite its growing importance in today's economy. Whether managing personal finances, launching entrepreneurial ventures, or participating in the gig economy, graduates increasingly need financial skills that are often absent from formal curricula.

Finally, career planning emerged as another area of differing perspectives. Students strongly valued it, with many rating it as one of the most important skills needed today. However, this priority was not mirrored in faculty responses and did not appear prominently in curriculum design. The lack of institutional emphasis on structured career guidance suggests a gap between student expectations and academic support systems.

These areas of disagreement emphasize the need for continuous dialogue and alignment between educational institutions and industry stakeholders. Bridging these gaps will require curriculum reform, a shift toward experiential and interdisciplinary learning, and an openness to integrating emerging workplace expectations into academic planning. Only through such efforts can the education system more effectively prepare graduates for sustainable, real-world success.

Discussion of findings for RQ5. What gaps are identified in secondary sources between academic preparation and real-world skill expectations for students, recent graduates, and educators?

RQ5 examined respondents' views on enhancing the alignment between academia and industry demands. Data highlighted the necessity of continuous faculty development, advocating

faculty participation in professional development programs and industry internships. Such experiential learning would allow faculty to incorporate practical insights into their teaching methods and modify curricula to meet changing industry standards. The combined evidence for RQ5 yielded seven major themes.

Major Theme 1: Bridging Strategies and Recommendations

This theme summarizes the practical suggestions and solutions that have been made to address the gaps between what students learn and what employers expect. It focuses on strategies that will make IT graduates more employable by encouraging closer collaboration between stakeholders.

Respondents consistently stressed the need for structured faculty development programs, including professional training, industry internships, and sabbaticals that help educators stay up to date with technological advancements and workplace practices. They also said that curriculum co-creation, which involves getting input from both employers and alumni, is important for creating courses that reflect the skills needed in the real world and new trends in the industry.

Furthermore, the addition of career readiness modules such as mock interviews and communication skills training was suggested to get students ready for job search challenges. Mandatory internships and work-integrated learning opportunities were seen as essential parts of this process.

Digital and hybrid learning models, such as online certifications, virtual labs, and Massive Open Online Courses (MOOCs), were also advocated as adaptable and expandable ways to enhance traditional teaching methods and increase access to knowledge that is relevant in the workplace.

These bridging techniques all show how important it is to take a proactive, collaborative, and flexible approach to education reform in order to provide graduates the skills they need to flourish in a fast-changing IT world.

Major Theme 2: Culturally Rooted Education

This theme highlights the significance of integrating local culture, language, and traditional knowledge into the educational framework to enhance the relevance and inclusivity of academic programs. Education systems must transcend a purely standardized or globalized curriculum and instead embrace the rich cultural and linguistic diversity present in India's extensive socio-economic landscape.

Including culturally appropriate teaching tools, localized content, and respect for indigenous knowledge fosters better comprehension and engagement, particularly among students from rural and underserved area. The revival and empowerment of traditional jobs through the use of digital tools and business training was seen as an important way to protect heritage while creating sustainable job opportunities.

Faculty supported personalized and multidisciplinary education models that take into account regional differences, promote ethical values, and focus on overall growth, such as emotional intelligence, critical thinking, and adaptability. By rooting education in cultural identity, institutions can create a learning experience that reflects students' real-life experiences, boosts their confidence, and gets them ready for both work and making a difference in society.

This culturally based approach to education is a good way to connect what you learn in institutions with how you can use it in the real world. It ensures that what you learn in institutions is useful to both your local community and the global business sector.

Major Theme 3: Educator Perspectives and Limitations

This theme explores the challenges and constraints faced by faculty members that hinder their capacity to adequately equip students for industry requirements. Faculty members emphasized that they are often burdened by substantial administrative and clerical responsibilities, which considerably diminish the time and attention allocated to teaching and curricular innovation

Unlike prestigious institutions like IITs or international universities—where faculty focus primarily on teaching and research—educators in many engineering colleges juggle multiple roles, including administrative tasks, paper work for accreditation (e.g., NAAC, AICTE), and examination duties. This diverts attention from core teaching responsibilities and inhibits continuous professional development.

Very few institutes follow global best practices—like those in Shanghai highlighted by Bill Gates—showcasing how structured peer mentoring, study groups, and professional feedback loops can dramatically uplift teaching quality.

There are other problems, such as not enough opportunities for faculty to learn new skills and exposure to current industry practices, which leads to professional isolation and outdated teaching methods. Institutional inertia and resistance to change in academia were also mentioned as reasons why new teaching methods and new technologies are not being used in the classroom. Inadequate funding for faculty upskilling further exacerbates the problem, limiting their ability to stay updated.

Initiatives such as Infosys' sabbatical program for faculty and the National Education Policy’s proposal for mandatory faculty internships remain underutilized due to institutional hesitancy and lack of systemic support. In India, top-performing graduates tend to prefer working for multinational corporations over pursuing teaching roles, resulting in a talent drain

from education. This diminishes the pool of qualified educators capable of driving educational reforms

Together, these educator-related limitations underscore systemic issues that make it difficult to align academic programs with evolving job market. To improve the quality and relevance of higher education in Information Technology, it is important to address these problems through targeted faculty development programs, workload optimization, and incentives to attract and keep talented teachers.

Major Theme 4: Industry Expectations and Feedback

This theme captures the perspectives of industry professionals regarding the skills, attributes, and competencies they expect from fresh graduates entering the workforce. Industry professionals highlighted that beyond technical knowledge, employers increasingly value adaptability, critical thinking, problem-solving abilities, and strong interpersonal skills such as teamwork and communication.

The industry's feedback indicates the need for graduates to quickly learn and apply new tools, take initiative, and effectively collaborate within dynamic work environments. This feedback from the industry is important for informing academic institutions about evolving workforce demands and guiding curriculum updates to better prepare students for real-world problems.

Major Theme 5: Misalignment Between Academic Curriculum and Industry Needs

This major theme focused on how do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment. A persistent challenge in higher education, particularly in technical and professional fields, is the growing disconnect between what students are taught in academic

institutions and the skills required by employers in the real world. This misalignment can lead to underprepared graduates and frustrated employers, impacting both employment rates and workforce productivity

Experts consistently pointed out that academic programs often stay static and excessively focus on theory, failing to include the latest technologies, practical tools, and soft skills essential for success in the industry.

The slow pace of curriculum updates means that graduates aren't ready for the demands of modern IT jobs, which in turn results in employers having to do a lot of retraining, thereby impeding seamless workforce integration. This misalignment also extends to assessment systems that give more weightage to theoretical knowledge, than to practical skills and problem-solving abilities.

Respondents said that the curriculum's reactive nature—adapting only after industry trends have peaked— makes the skills gap even bigger. Also, insufficient emphasis on experiential learning opportunities and exposure to domain-specific tools compounds graduates' lack of readiness.

This lack of preparation has a negative impact on the confidence of the graduate and employer’s satisfaction. This makes it imperative to make changes to the curriculum proactively. This should take into account feedback from industry, focus on practical skills, and keep up with new technologies**.**

Major Theme 6: Perceived Value of Academic Education

This theme examines the varied perceptions regarding the inherent and instrumental value of academic education as it relates to employability and career readiness. Respondents acknowledged that, despite recognized gaps between curriculum content and industry needs, the

foundational academic knowledge imparted by universities remains valuable. Core theoretical concepts and a strong academic foundation were seen as essential building blocks that support deeper learning and future skill acquisition.

However, respondents also emphasized that having a degree or formal qualification does not necessarily equate to job readiness. This disconnect often leads to the view that degrees alone are not indicators of employability, and it is important to supplement academic credentials with applied learning and upskilling.

There was a shared emphasis on promoting lifelong learning, where graduates are encouraged to pursue ongoing personal and professional development beyond formal education. The recognition that much of the practical, job-specific knowledge is acquired on the job further underscores the need for academic programs to balance conceptual understanding with experiential learning opportunities.

This theme reflects a nuanced perspective on academic education's role: foundational yet incomplete without integration of real-world experience, adaptability and continuous learning.

Major Theme 7: Student and Fresher Readiness

This theme examines the preparedness of students and recent graduates as they transit from academic environments into professional IT roles. Respondents highlighted significant concerns regarding the lack of practical experience, low confidence levels, and inadequate soft skills, which collectively impede freshers' ability to perform effectively in the workplace.

Despite possessing theoretical knowledge, many graduates have trouble articulating their ideas during interviews and while working in teams, which is often important criteria in getting hired and having a successful early career. Additionally, the transition from study to work is

marked by difficulties adapting to professional culture, expectations and dynamic work environments.

From the students' perspective, there exists a need for multidisciplinary education. By the time new trends are integrated into syllabi, they are often outdated. Recruiters from companies like TCS and Accenture report retraining graduates entirely—regardless of their discipline—raising concerns about the practical value of academic learning. A solution lies in proactive industry-academia collaboration. Industry leaders should be involved in syllabus planning to align academic content with near-future requirements.

The discussion of findings of RQ1, RQ2, RQ3, RQ4, and RQ5 provide valuable insights into several critical aspects of engineering education and career readiness. Specifically, the study highlights:

A. Campus Connect: Bridging the Academia-Industry Gap in IT Graduate Employability
B. Corporate Social Responsibility (CSR) Projects and IT Graduate Employability in India
C. Hybrid Learning and Research: Enhancing Employability Skills of IT Graduates in India
D. National Education Policy (NEP) and Its Implications on Employability Skills of IT Graduates in India
E. Empowering Rural India through AI: Preserving Heritage and Creating Sustainable Livelihoods
F. Shifting from Rote to Real Learning for Employability

A. Campus Connect: Bridging the Academia-Industry Gap in IT Graduate Employability

India's rapidly growing Information Technology (IT) sector has emerged as a significant economic growth and employment driver. However, a persistent challenge remains: the significant gap between the skills university graduates possesses and industry expectations. As highlighted in the research on Employability Skills of Information Technology University Graduates in India, there is an urgent need for focused, structured programs that align academic learning with real-world skill requirements. As mentioned by one of the faculties, “one such notable initiative is the Campus Connect Program by Infosys and similar efforts by other IT firms, designed to bridge this divide and enhance the employability of graduates.”

In Indian universities, especially in Tier 2 and Tier 3 cities, there remains a gap in the quality and relevance of technical education. Curricula often lag behind current technological trends, and faculty members frequently face administrative burdens that limit their ability to update themselves with industry practices (Kumar et al., 2024). Moreover, students are often taught to focus on academic marks rather than skill development, creativity, or real-world problem-solving.

As a result, IT companies spend extensive time and resources retraining fresh recruits—regardless of their degrees—before they work on projects. According to various industry reports, more than 50% of engineering graduates are not directly employable in IT roles due to a lack of soft skills, coding proficiency, and understanding of contemporary tools and platforms (Li, 2024).

Campus Connect programs provide a remedy to this systemic issue by engaging industry within academia. By cultivating a collaborative partnership between IT companies and academic institutions, these programs seek to enhance graduates' job readiness and alignment with the current market demands.

Infosys launched its Campus Connect program in 2004 with the primary objective of enhancing the quality of IT education in engineering colleges (India Skills Report, 2016). The program operates on several levels, including:

1. **Faculty Enablement:** Providing faculty with training sessions and workshops on the latest technologies, methodologies, and teaching practices.
2. **Student Projects and Internships**: Facilitating real-world project experience and internships that expose students to industrial workflows.
3. **Curriculum Enhancement:** Advising colleges on updating and customizing course content to match evolving IT industry trends.
4. **Soft Skills Training:** Offering modules on communication, teamwork, problem-solving, and professional ethics—key elements of employability.
5. **Certification and Recognition:** Certifying students who complete modules give them a competitive edge in recruitment.

These elements make the program a robust model for addressing employability challenges, particularly in the IT sector. Campus Connect directly tackles the disconnect between theoretical knowledge and industry-required competencies (CMIE, 2023)

1. **Skill Alignment:** The program ensures that students learn skills that are directly relevant to current job roles by involving industry professionals in curriculum design and delivery.
2. **Project-Based Learning:** Encouraging students to work on real-time projects helps cultivate critical thinking, coding proficiency, and collaboration—skills often missing in traditional academic settings.

3. **Faculty Industry Exposure:** The faculty sabbatical initiative within Campus Connect (though not widely adopted) aims to align teaching with current technologies, reducing the knowledge gap between classrooms and companies.
4. **Soft Skills Emphasis:** The program includes training in interpersonal skills, which the research identifies as crucial for employability alongside technical know-how.

Moreover, Campus Connect emphasizes regional inclusivity, making special efforts to reach colleges in rural and semi-urban areas. This aligns with the future research direction about AI access and skill development in rural India, ensuring that students outside urban centres are not left behind in the digital economy (India Science, Technology and Innovation Portal).

Challenges in Implementation

Despite its promise, the effectiveness of Campus Connect programs faces some challenges:

1. **Institutional Resistance:** Many colleges are reluctant to align too closely with industry, fearing loss of academic autonomy.
2. **Faculty Workload:** As noted in the research, faculty in many institutions are overburdened with clerical and administrative tasks, leaving little time for training or innovation.
3. **Sporadic Engagement:** The program's effectiveness depends on sustained and active participation from academia and industry. However, engagement often remains superficial, with workshops treated as token events.

These challenges highlight the need for systemic reforms and stronger government-industry-academia collaboration, including regulatory policies that mandate and incentivize programs like Campus Connect.

To truly leverage Campus Connect and similar initiatives in enhancing the employability of IT graduates, the following steps are recommended based on insights from the research:

1. **Mandatory Faculty-Industry Internships:** Government policies should encourage or mandate short-term industry exposure for faculty to keep them updated with real-world technologies.
2. **Outcome-Based Curriculum Reforms:** Universities must revamp curricula to include emerging technologies like AI and data science and adopt domain-specific applications, as emphasized in the research.
3. **CSR Utilization:** IT companies should be encouraged to invest their CSR funds into academic partnerships, faculty training, and student development programs.
4. **Evaluation of Impact:** Periodic audits should be conducted to evaluate the effectiveness of Campus Connect-type programs and make data-driven improvements.
5. **Localization and Inclusivity:** To ensure equitable skill development, these programs should be accessible in local languages and adapted to the socio-economic context of rural and underserved areas.

Campus Connect is more than a corporate social responsibility initiative—it is a strategic intervention to bridge the gap between academic preparation and industry expectations. Research on the employability of IT graduates in India highlights the urgency of such initiatives (Mezghani and Turki, 2025). By fostering a culture of collaboration, aligning education with employment and investing in faculty and student capabilities, Campus Connect can serve as a model for educational reform across all fields.

In the evolving landscape of IT and digital transformation, the employability of graduates will hinge on how well academia and industry can work together. Campus Connect represents a powerful vehicle to drive this synergy forward, ensuring that India's young talent is educated, prepared, empowered, and employable.

B. Corporate Social Responsibility (CSR) Projects and IT Graduate Employability in India

India's Companies Act 2013 mandates profitable firms spend at least 2% of their average net profits on CSR activities, encouraging major IT companies—such as TCS, Accenture, Infosys, Wipro, and HCL—to invest strategically in education and skill development. For researchers studying the employability of Information Technology (IT) graduates, CSR-funded initiatives present a valuable mechanism to address skill gaps in technical proficiency, communication, adaptability, and industry readiness (Bag & Dutta, 2021).

Some flagship CSR programs include:

- TCS's "Ignite" and "Youth Employability" Programs
- Infosys Foundation's Computer Literacy Projects
- Wipro's Mission10X and Education Fellowships
- HCL Foundation's "TechBee" and "MySchool" programs
- IBM "SkillsBuild" and Microsoft's "Code Without Barriers"

All the above programs are examples of targeted interventions. These programs combine infrastructure development, training modules and mentorship to equip students with practical, job-ready competencies. Corporations can drive systemic improvements in graduate performance by aligning CSR schemes with UN Sustainable Development Goals—particularly Quality Education (SDG 4) and Decent Work (SDG 8).

The research by Sutil-Martín and Otamendi(2021) highlights four critical employability domains: technical skills, soft skills, experiential learning and inclusivity. CSR-funded digital labs, cloud-based virtual classrooms, and hackathon hubs provide hands-on exposure to coding languages, data analytics, and cybersecurity tools, directly addressing technical gaps. Soft skill workshops—covering communication, teamwork, and professional etiquette—prepare graduates for corporate environments that appreciate interpersonal effectiveness. Furthermore, CSR-sponsored internships and community technology projects offer real-world experience, fostering problem-solving abilities and adaptability.

An often-overlooked aspect is faculty development. As the study reveals, outdated teaching methodologies constrain student learning. CSR can bridge this gap by funding "train-the-trainer" programs, industry residencies for educators, and collaborative Faculty Development Programs (FDPs) with bodies like AICTE and NASSCOM. When faculty gain currency in emerging technologies and pedagogical innovations, they are better positioned to mentor students and integrate industry-relevant content into coursework (Mergel et al., 2019).

To have the most effect, CSR programs need to go beyond one-time workshops and be part of academic curricula. Formal Memoranda of Understanding (MoUs) between businesses and universities can include credit-bearing CSR modules, capstone projects, and joint certification schemes. Aligning CSR activities with university assessments and placement processes raises their perceived value and keeps students interested. (Miller and Akdere, 2019)

Despite their promise, CSR projects face challenges. Many localized pilots remain, lacking scalability. Short-term interventions may not yield enduring skill improvements, and metrics for evaluating employability outcomes are often absent. There is an urban bias, with rural

and semi-urban institutions receiving less attention, which results in continued regional inequities in IT education. (Miller and Akdere, 2019)

The research yields several recommendations. Firstly, CSR program design should be informed by data, utilizing academic insights to address specific skill deficiencies. Secondly, collaboration among corporations, academia, and government is essential to create integrated ecosystems for efficient skill development and employment pathways. Thirdly, CSR investments should extend to rural regions, providing foundational training in AI, cloud computing, and digital literacy in local languages. Lastly, rigorous monitoring and evaluation frameworks should be established to assess the impact on employability metrics such as placement rates, time-to-productivity and job retention.

In conclusion, CSR offers a powerful tool for making IT graduates more employable. By strategically aligning corporate resources with academic needs, investing in faculty and student capabilities, and fostering inclusive, scalable programs, IT companies can help bridge the divide between classroom learning and industry demands, thereby nurturing a future-ready workforce in India. Continuously refining CSR strategies based on academic research, will ensure an equitable, globally competitive IT sector.

C. Hybrid Learning and Research: Enhancing Employability Skills of IT Graduates in India

In India's rapidly evolving educational landscape, hybrid learning has emerged as a transformative model that blends traditional face-to-face instruction with digital technologies. This approach has profound implications for the employability skills of Information Technology (IT) graduates. (Aithal and Maiya, 2023)

Hybrid learning is well-positioned to address some of the key challenges in the employability of IT graduates, particularly those related to technical proficiency, adaptability, and practical experience. While traditional education models often focus heavily on theoretical knowledge, hybrid learning allows students to gain real-world exposure through online platforms, industry collaborations and practical assignments. This can bridge the gap between what is taught in classrooms and the skills demanded by employers in the tech industry. (Pavlidou et al., 2021)

One of the key strengths of hybrid learning is its ability to offer flexible, personalized learning experiences. In the case of IT education, where rapid technological advancements continuously reshape industry needs, the ability to update curricula dynamically is crucial. Online resources, open-source software, and interactive platforms like Coursera, edX and Udemy allow students to access the latest trends in programming languages, data science, artificial intelligence (AI) and cybersecurity, providing them an edge in acquiring current skills. In addition, hybrid learning makes integrating learning with real-time applications possible. (Almgerbi et al., 2022) For instance, students can work on virtual labs or collaborate on global projects using cloud-based platforms, gaining exposure to real-world issues without needing to leave the campus. This exposure helps students develop practical, hands-on skills in high-demand areas such as machine learning, cloud computing, and data analytics.

Another significant advantage of hybrid learning is its potential to address the faculty development issue, which the research identifies as a barrier to the employability of IT graduates. Many faculty members, particularly in smaller or underfunded institutions, face challenges staying updated with industry trends. Through hybrid learning, faculty members can participate in online professional development programs, access research journals and collaborate with

industry professionals to update course materials and teaching strategies. This ensures that students are taught by instructors who are not only experts in their field but also well-versed in the current challenges and opportunities in the tech industry (Mulenga and Shilongo, 2025).

Hybrid learning also facilitates research-oriented education, which is critical for developing problem-solving and critical thinking skills among IT graduates. By incorporating research-based assignments, project work, and industry case studies into the curriculum, students can engage in applied research that tackles real-world problems. Integrating research into the learning process encourages innovation, a key employability skill in the IT sector, where the ability to solve complex challenges is highly valued. Hybrid learning platforms can also provide access to research databases, virtual conferences, and online collaborations with other institutions, helping students stay connected to global research trends and networks (Mulenga and Shilongo, 2025).

Also, hybrid learning can meet the needs of a wide range of students, especially those from rural or underserved areas, by giving them access to high-quality online learning materials. The research shows that differences in the quality of education between regions make it harder for IT graduates to find jobs. Hybrid learning could help level the playing field by giving students in rural areas the same access to high-quality resources as students in urban areas (Van De Werfhorst et al., 2022). Online learning platforms can also be localized in regional languages, which makes the content easier to understand and access.

Even though hybrid learning has a lot of potential, there are some problems that make it hard to use widely in India. For example, in rural areas, there may not be enough infrastructure to support high-speed internet and digital devices. Also, moving to online education requires a cultural shift among students and faculty, who may need time to get used to this new way of

learning. The research shows how important it is to develop faculty, and it is clear that for hybrid learning to work, teachers need to learn how to use digital teaching methods and use technology in their teaching. (Gupta and Saranya, 2024).

To get the most out of hybrid learning, policy changes are needed to improve infrastructure and give both students and faculty digital literacy training. Institutions also need to spend money on creating a strong framework for blended learning, where students are given clear instructions on how to balance online and offline learning experiences. This would mean creating hybrid curricula that meet the needs of the IT industry and adding internships, industry partnerships, and real-world projects to the learning process (Mulenga and Shilongo, 2025).

In conclusion, hybrid learning offers a significant opportunity to enhance the employability skills of IT graduates in India. By integrating flexible online resources with traditional in-person education, this model facilitates the acquisition of contemporary, industry-relevant skills while encouraging research, innovation, and practical experience. With appropriate infrastructure, faculty development, and policy support, hybrid learning can be instrumental in equipping IT graduates to address the demands of the swiftly changing global technology landscape, thereby enhancing their employability and career prospects.

D. National Education Policy (NEP) and Its Implications on Employability Skills of IT Graduates in India

The National Education Policy (NEP) 2020 represents a significant overhaul of the Indian education system, offering a progressive framework to align the nation's academic landscape with the global knowledge economy. For researchers and educators concerned with the employability skills of Information Technology (IT) university graduates in India, the NEP emerges as a powerful enabler of change. By focusing on flexibility, interdisciplinary education,

and industry-relevant competencies, NEP provides a foundation to close the persistent gap between academic output and industry expectations. (Kumar, 2021).

A significant highlight of the NEP (2020) is its learner-centric 5+3+3+4 curriculum structure, which introduces critical thinking, coding, design thinking, data handling, and experiential learning from an early age. This shift from rote learning to competency-based education is crucial for IT graduates, whose professional success depends not just on technical knowledge but also on practical problem-solving, communication, collaboration, and continuous learning—core employability skills highlighted in the research.

NEP's emphasis on foundational literacy, numeracy, and early digital literacy ensures that students are better equipped to understand logic, algorithms, and computational thinking—the building blocks for careers in IT. More importantly, these basic skills get students ready for more advanced learning at the undergraduate level, where the employability gap usually shows up.

NEP's proposed reforms in higher education address this directly. The policy calls for multidisciplinary education, flexible degree programs, and multiple entry and exit options. This means IT students can combine their core technical education with courses in communication, entrepreneurship, or even design, which is what today's IT industry needs. (Kulal et al., 2024)

A game-changing idea of the NEP(2020) is the creation of an “Academic Bank of Credits” (ABC), which will let students earn and transfer credits between universities and fields of study. This could encourage IT students to take short courses, get certifications or do internships that are in line with industry trends—important steps in getting ready for a job. These kinds of modular and stackable learning opportunities fit well with the upskilling pathways.(Kulal et al., 2024)

Integrating vocational education at all levels is another important NEP(2020) initiative that will affect employability. By 2025, NEP wants at least 50% of students to have some exposure to vocational education. For IT students, this means stronger internship programs, live projects and working with start-ups and big companies—things that the research showed were important when looking at skill preparedness.

Another important area where NEP addresses employability issues is faculty development. The results show that students' growth is limited by faculty members who are not update and don't have enough industry experience. NEP requires educators to keep learning and encourages faculty members to do internships in industry. This makes sure that faculty members stay up to date with new technologies and teaching methods, which means that students get more relevant content and training. (Amani, 2024)

One of the most transformative aspects of NEP is its focus on digital learning and establishing a National Educational Technology Forum (NETF). The COVID-19 pandemic has proven that digital tools are indispensable to modern education. For IT students, familiarity with online tools, cloud platforms, remote collaboration software, and virtual labs is essential. NEP supports these tools and encourages their integration into curricula and assessments, aligning well with the digitally driven nature of IT careers. (Nageswari, 2022)

While primarily aimed at improving comprehension in early education, the NEP's multilingual approach has indirect benefits for employability. Communication skills in both vernacular and English are critical in the workplace. Promoting regional languages alongside English can help IT graduates become better communicators, mainly when working in diverse teams or on projects impacting rural and semi-urban India—sectors gaining increasing IT traction.

The policy's focus on research and innovation through the creation of the National Research Foundation (NRF) opens avenues for IT students to work on hands-on, interdisciplinary projects. This helps them develop analytical thinking, innovation, and entrepreneurship (Agrawal et al., 2024). These aren't just academic exercises; they're also important for getting a job in the tech industry, where innovation drives growth (Agrawal and Haneef, 2024).

For governance, NEP suggests that institutions be given more freedom and that Multidisciplinary Education and Research Universities (MERUs) be allowed to grow. These institutions will be examples of quality with strong ties to the business world. For IT graduates, this could mean better connections with the business world, access to advanced labs, industry-sponsored capstone projects, and better job placement systems (University Grants Commission, 2020).

The NEP(2020) also explicitly addresses equity and inclusion, ensuring that students from marginalized backgrounds are supported through scholarships, infrastructure and personalized learning strategies. In the context of research, this is vital. Bridging the digital divide and ensuring that employability training reaches all students—irrespective of geography or socioeconomic status—is necessary to prevent systemic skill gaps in the IT sector.

Importantly, NEP calls for restructuring assessment systems to focus on competency over memory. This aligns perfectly with industry expectations, which value demonstrating skills over theoretical knowledge. By encouraging formative assessments, project work and e-portfolios, NEP paves the way for students to develop and showcase tangible skill sets.

Moreover, NEP promotes entrepreneurial thinking, which research identified as a rising trend among IT graduates. The policy's support for incubation centres, innovation hubs, and

start-up ecosystems on campuses enables students to explore self-employment and tech entrepreneurship—a much-needed shift in India's job market. (Startup Policy, 2019)

In conclusion, The National Education Policy 2020 provides a comprehensive framework that corresponds with research findings regarding the employability skills of IT graduates in India. It seeks to bridge the persistent gaps between academia and industry through adaptable curricula, digital integration, faculty development, vocational exposure, and the promotion of research. Nonetheless, the primary challenge lies in the effective and consistent implementation across India's extensive educational landscape. Policymakers, educators, industry stakeholders, and students must collaborate to ensure that the NEP's vision is realized in tangible outcomes. Only then can we truly equip IT graduates with the necessary employability skills to succeed in the global digital economy.

E. Empowering Rural India through AI: Preserving Heritage and Creating Sustainable Livelihoods

The conversation around Artificial Intelligence (AI) is often dominated by fears—machines replacing human jobs, automation rendering professions obsolete, and a future where human effort seems redundant. While these concerns are valid to some extent, they overlook a more profound and hopeful story: the power of AI to create new opportunities. As stated by industry expert, “Most discussions centre on the marvels of NLP, neural networks, and machine learning, focusing mainly on urban industries. However, India's real opportunity lies beyond its cities—in its villages, people and traditional skills.”

India's rural population, comprising approximately 65% of the total populace, holds an incredible wealth of diverse skills passed down through generations. As digitalization picks up speed, a significant portion of the younger generation has migrated to urban areas for better

opportunities, inadvertently leading to the erosion of traditional skills and professions (Sindakis and Showkat, 2024). However, adding AI, digital tools, and business training to rural jobs is a powerful way to keep cultural heritage alive and create jobs that will last.

AI and digital technologies can do more than just replace human workers; they can also help, enhance, and modernize traditional jobs. By combining technology with local knowledge and craftsmanship, we can make sure that heritage is preserved and thrives in the modern economy. Mentioned below are some traditional jobs that can be improved with the help of AI, robotics, and digital tools:

1. Cobblers

Once a common sight in every Indian locality, cobblers have gradually disappeared. However, with digital empowerment, the profession can be reimagined. Imagine a cobbler's child trained in business skills and digital platforms—offering services through mobile apps, receiving customer specifications online, and creating customized, ergonomic footwear using AI-based foot scanning. Digital kiosks in semi-urban and rural markets could enable cobblers to provide high-quality, made-to-order shoes that are stylish, affordable, and rooted in traditional skills (Kumar S., 2023).

2. Pottery and Clay Artisans

The demand for handmade pottery has gone down a lot because of mass production. However, AI-powered tools like CAD for pottery design and automated kiln temperature control can make traditional pottery-making better and faster. Artisans can sell personalized clay products all over the world thanks to e-commerce platforms and training in online branding. Interactive workshops and live-streamed crafting sessions can also help people around the world appreciate the craft, which will keep it alive and make it profitable.

3. Handloom Weaving

Handloom weaving is a traditional Indian craft that has had a hard time competing with industrialized textile production. However, teaching weavers how to use digital textile design and online marketing can help reposition handloom products as luxury or eco-friendly items. Direct-to-consumer sales on platforms like Instagram, Etsy, or curated fashion marketplaces can help artisans reach a wider audience and make more money. Using AI to analyse designs and predict trends can also help artisans keep the soul of the craft while still meeting market demands. (Mamidipudi and Bijker, 2018)

4. Blacksmithing and Metal Craft

Blacksmithing has always been an important part of rural life, from making tools to making utensils and farming tools. With AI-powered precision tools and 3D modeling, traditional blacksmiths can improve their work to meet modern engineering standards. Their children can learn how to make digital prototypes, which will allow them to work with agricultural tech companies or start rural fabrication units. These units could meet both traditional and modern custom needs in a sustainable way.

5. Embroidery and Textile Arts

Rural embroidery artisans, particularly women, possess intricate hand skills often overlooked in mainstream fashion. Artisans can scale their work while retaining authenticity by integrating AI-driven embroidery machines, digital pattern creation tools, and online tutorials. Brands can collaborate with rural embroidery clusters to offer limited-edition designs that are globally marketed but locally made. Platforms like Pinterest or AI-curated online shops can connect artisans directly to customers seeking exclusive, handcrafted fashion.

6. Bamboo and Cane Craft

Artisans in India who work with bamboo and cane, especially in the Northeast, could sell their work to people all over the world who want eco-friendly and sustainable decor. They can use AI-based design systems to make new furniture or home decor items, and AI-driven demand forecasting can help them plan their production cycles. With the help of digital marketing and logistics platforms, their crafts can reach international markets, bringing this green profession back to life.

Instead of relying on mass-produced branded goods, we could picture "craft-tech kiosks" where customers can choose the size, colour, material, and design inspiration they want. Local artisans with both traditional skills and digital tools could then make personalized items. These hubs could serve customers in cities, suburbs, and rural areas, turning rural artisans into tech-savvy business owners.

F. Shifting from Rote to Real Learning for Employability

One of the insights from this research is the gap in students' attitudes toward learning from early school days. Many learners still view education merely as a means to clear exams, rather than as a process of self-discovery or preparation for meaningful occupation. This narrow focus often stifles curiosity, limits innovation, and hinders adaptability—qualities increasingly vital in today's dynamic and unpredictable job market.

To solve this problem, we need to change the way we think about and do education from the very beginning. Education should be more than just passing on information; it should also teach students how to learn—how to think critically, reflect deeply, and keep growing. As Gandhi(1953) said in his philosophy of Nai Talim, true learning happens through work that is socially meaningful and productive. When students learn by doing, they don't just take in information; they connect with it, use it, and turn it into wisdom.

Gandhi (1953) argues in the Nai Talim that the true source of knowledge should be socially useful and productive work. It should be a "upward spiral"—where work generates knowledge, and knowledge refines and deepens work. Education is not a mechanical routine but a joyful human enterprise that should lead to empowerment, innovation, and societal transformation. Learning must be grounded in reality—not limited to books, YouTube, or AI tools, but deeply embedded in action and reflection.

The National Education Policy (NEP) 2020 echoes this vision, emphasizing the need for competency-based, experiential learning that encourages adaptability and lifelong self-improvement (Ministry of Education, 2020). It also advocates a multidisciplinary and holistic model, which is crucial in today's interconnected world. Employers no longer look for IT professionals with isolated technical skills—they seek individuals who can think across domains, solve complex real-world problems, and adapt to sectors like healthcare, agriculture, finance or design.

In this context, education must transform into a human-centred paradigm that promotes resilience, inclusivity, and ethical responsibility. It should cultivate not only intellect but also empathy, collaboration, and creativity. By anchoring learning in experience and relevance, we can motivate students to assume responsibility for their development—ensuring they emerge not only employable but also empowered to lead and contribute significantly to society.

5.3 Implications

The findings of this research highlight the necessity to recalibrate India's academic ecosystem to meet the changing requirements of the contemporary workplace. The current disjunction between theoretical instruction and industry expectations has profound consequences

for students, educators, institutions, and policymakers. This misalignment not only hampers employability but also exacerbates challenges such as graduate underperformance, dissatisfaction among students, faculty, and industry, and the increasing urban-rural skill divide.

Implications for RQ1. How do students and freshers perceive the effectiveness of their educational experience in equipping them with the skills and knowledge necessary for employment?

The findings suggest that students and freshers perceive their education as insufficient in preparing them for the demands of the job market, especially regarding practical experience and soft skills development. The study indicates a need for more industry-aligned curricula and hands-on learning opportunities to help bridge the gap between academic learning and real-world application. The findings provide strong evidence for integrating more experiential learning activities into the educational system to enhance students' preparedness for employment.

Implications for RQ2. What challenges do faculty members identify in aligning the curriculum with evolving industry requirements and in ensuring effective skill delivery?

Faculty members face significant challenges in aligning the curriculum with industry needs due to several factors, including heavy administrative burdens, lack of industry exposure, and inadequate funding for professional development. These challenges contribute to a delay in updating curricula to reflect current industry trends and emerging technologies. The study highlights the importance of faculty development programs and increased collaboration between academia and industry to address these issues effectively.

Implications for RQ3. What key skills and competencies needed for successful employment in today's job market are lacking

The graduates were found to be lacking in technical and soft skills and generally ill-equipped to navigate the real-world challenges that arise in professional setting. This was particularly evident in domains that demand problem-solving and critical thinking abilities.

Implications for RQ4. To what extent do students, freshers, faculty members and industry agree on the key skills and essential competencies for successful employment in today's job market?

The study reveals some alignment between the skills perceived as important by students, freshers, faculty members and industry particularly in technical areas. However, significant differences exist in the emphasis on soft skills such as communication, problem-solving and adaptability. This finding underscores the need for a more comprehensive approach to curriculum design that includes technical skills and soft skills training to better prepare graduates for the workforce.

Implications for RQ5. What gaps are identified in secondary sources between academic preparation and real-world skill expectations for students, recent graduates, and educators?

The research identified a substantial gap between the skills students acquire during their academic training and the skills employers expect in the workforce. Students and educators recognized the need for more hands-on experience, industry collaborations, and a focus on technical and non-technical competencies. To address these gaps, the study recommends implementing mandatory internships, industry partnerships and a curriculum update incorporating emerging technologies and soft skills training, ensuring students are better equipped for their professional careers.

One of the most pressing implications is the realization that academic institutions must become proactive agents of change rather than passive transmitters of outdated syllabi. Faculty members, overburdened by administrative responsibilities, are unable to devote time to continuous learning or engaging with emerging technologies. Unless addressed, this structural inefficiency will perpetuate an outdated academic model. Institutions need to invest in faculty upskilling, either through industry sabbaticals, collaborative projects, or technology-enabled peer learning platforms.

Another implication is the gap in student attitudes toward learning. The research shows that many students are conditioned to view academic performance as a route to passing exams rather than preparing for a dynamic career. This calls for a paradigm shift in how education is perceived and delivered. Practical exposure, emotional intelligence training, and real-world applications must be integrated into mainstream pedagogy. When students see relevance in what they study, their motivation, retention, and long-term engagement significantly increase.

The research also highlights the role that industry can and must play in shaping future-ready graduates. However, the current model often sees industry voicing its dissatisfaction with graduate skill levels while remaining disengaged from the academic system. Encouraging active industry participation in syllabus co-design, mentorship, and infrastructure development could significantly narrow the skill gap.

At the policy level, it is clear that government regulations must facilitate—not hinder—such collaborations, through incentives, funding schemes, and streamlined accreditation processes. Naik (1975) consistently emphasized that all decisions in education are inherently political. He focused on the political economy of education and often observed a paradox: while educational decisions are concentrated in the hands of politicians, many of them lack sufficient

educational literacy. Acknowledging this gap, Naik strongly advocated for meaningful and sustained dialogue between educationists and policymakers to ensure informed decision-making in the education sector.

Another gap lies in the lack of contextual and culturally grounded education. Education systems often prioritize standardized content, which can alienate students from rural or diverse linguistic backgrounds. Experts recommend leveraging India's cultural heritage and diversity—like drawing on stories of Chhatrapati Shivaji Maharaj for leadership lessons or using localized examples in early education—to foster conceptual clarity, inclusivity, and identity.

Bridging these gaps also calls for a reimagination of how technology and innovation are integrated into education. Introducing domain-specific applications of advanced technologies like AI allows for deeper, more practical learning experiences. Additionally, incubation centres, hackathons, and hands-on competitions can serve as dynamic platforms to cultivate innovation and entrepreneurial skills among students. Strategic use of CSR funds can further enable faculty training and institutional capacity-building—particularly in the colleges that supply talent to those very companies. This creates a virtuous cycle of investment and returns, aligning business goals with educational advancement.

Moreover, integrating indigenous knowledge with digital literacy and entrepreneurship can revive traditional vocations such as pottery and handloom weaving—transforming them into sustainable, modern businesses. This not only bridges the skill gap but also generates employment and preserves cultural heritage. Ultimately, addressing the gap between academic preparation and real-world expectations requires a holistic, multi-stakeholder approach—one that values teaching as a respected profession, aligns curriculum with industry needs, contextualizes learning for diverse populations, and promotes a balanced blend of tradition and technology.

The idea that AI will merely replace human labour is incomplete. AI can transform how we view work, especially in rural contexts. By blending traditional skills with digital empowerment and entrepreneurial thinking, we can preserve indigenous knowledge, revive endangered professions, and unlock a new wave of rural economic development. Rather than being displaced by technology, rural India has the potential to lead a quiet revolution—where tradition meets innovation, and AI becomes not a threat but a partner in progress.

5.4 Recommendations

To close this gap, we need a multi-faceted approach that includes institutional reform and active involvement from both industry and policymakers. Some of the most important steps are to focus on faculty development, create dynamic, industry-aligned curricula, and make education more culturally and contextually relevant. Setting up incubators and encouraging collaboration between academia and industry will give students the real-world problem-solving skills they need.

To move forward, academic institutions must streamline administration and secure funding for faculty upskilling, dynamic curriculum updates and contextualized education. By encouraging strong partnerships industry-academia and focusing on practical, ethical and cultural aspects, stakeholders can improve engineering education to produce adaptable, innovative graduates prepared for a rapidly changing global economy.

Recommendations for Practical Applications

Based on the results of this study, there are a number of practical steps that can be taken to better align educational curricula with the needs of the workforce, which will make IT

graduates more employable. These suggestions are meant to close the gap between what students are taught and what employers expect from them in terms of skills.

1. **Enhance Communication Skill Training:** Given the critical deficiency in communication skills such as leadership, emotional intelligence, teamwork, and problem-solving, educational institutions should integrate comprehensive communication modules into the curriculum. These should include practical exercises in both verbal and written communication, presentations and interpersonal interactions to build confidence and proficiency. These should be integrated into the curriculum through workshops, debate clubs, and leadership development programs.
2. **Strengthen Digital Literacy and Technical Expertise:** To address the gaps in digital literacy and technical knowledge, curricula must be updated regularly to include the newest technologies and software tools that are needed in the workplace. Students can gain important technical experience through hands-on labs, coding exercises, and workshops on digital tools
3. **Promote Leadership and Soft Skills Development:** Institutions should offer dedicated programs focusing on leadership, teamwork, adaptability, and emotional intelligence. Workshops, group projects, and real-world simulations can cultivate these soft skills, preparing students for dynamic workplace environments.
4. **Foster Innovation and Critical Thinking:** Changes to the curriculum should focus on case studies, research projects, and interdisciplinary learning that promote problem-solving, creativity, and critical thinking. Inquiry-based learning and open-ended problem solving will help students develop their analytical skills. In a world

where AI can write basic code, the real differentiator is knowing how to design efficient, scalable and sustainable systems

5. **Strengthen Industry-Academia Collaboration:** Partnerships with industries should be expanded to provide internships, live projects, and guest lectures These collaborations will offer students exposure to real-world challenges, bridging the gap between theoretical knowledge and practical application. Collaborations with industry experts can also facilitate guest lectures, workshops, and networking opportunities for faculty and students, providing exposure to professional environments.
6. **Continuous Faculty Development:** Faculty members should receive regular training through industry exposure, training workshops and collaborations with industry experts to stay updated with emerging technologies, pedagogical strategies and industry trends. Empowered educators can better equip students with relevant skills and mentor them effectively.
7. **Implement Regular Skill Assessments:** Institutions should conduct periodic assessments to evaluate students' progress in both technical and soft skills. Feedback from these assessments can guide personalized learning plans and targeted interventions. Instead of just testing students with written exams or multiple-choice questions, Students should be assessed for their practical skills, problem-solving approaches, and ability to work through challenges.
8. **Integrating Industry-Relevant Curricula**

Educational institutions should regularly update their curricula to include emerging technologies such as Artificial Intelligence (AI), Cloud Computing, Cybersecurity, and Blockchain. This ensures that students have up-to-date skills relevant to the fast-evolving tech

industry. Incorporating industry-aligned modules like Agile methodologies and projects into the curriculum can provide students with practical, hands-on experience.

9. Encouraging Entrepreneurial Mindsets

Encouraging entrepreneurship and innovation within academic settings can be an effective way to prepare students for the dynamic demands of the workforce. Universities can establish incubation centres and start-up mentorship programs to encourage students to take risks, come up with new ideas and get involved in entrepreneurial opportunities, fostering a culture of innovation.

10. Transdisciplinary Education

Transdisciplinary education is not just a pedagogical innovation; it is a workforce necessity. In the context of the thesis, it becomes clear that IT graduates who are trained to think across disciplines are significantly more employable, especially in a future shaped by AI, automation and cross-sector collaboration.

11. Making Education More Personalized

Our current system forces all students to follow the same path, even though each one has different strengths and interests. Instead of making all students follow the same path, institutes should offer core subjects along with a choice of electives. Giving students more choices would let them explore their interests while also learning skills they can use in their careers, whether it's programming, design, art, or entrepreneurship.

12. Bringing Industry Experts into the Classroom

One of the best ways to keep education relevant is by working closely with industry professionals. Guest lectures, real-world assignments, and mock interviews led by experts can give students a much clearer picture of what to expect in the job market. Another challenge

students face is project selection. Often, they struggle to choose meaningful projects and end up working on basic, college-level assignments that don't help them grow. Alumni mentorship programs can provide valuable guidance, helping students pick projects that align with industry needs and give them practical experience.

13. Rethinking Educational Policies

One of the biggest roadblocks to improving education is the way academic institutions operate. Many are owned by politicians rather than industry professionals, which limits their ability to stay relevant. If industries were given incentives to invest in colleges, there would better funding, higher faculty salaries, and stronger industry-academic partnerships. This would create opportunities for students to work on live projects and internships, making them more employable right from graduation.

14. Introducing Hybrid learning

Hybrid learning—a mix of online and face-to-face teaching—presents a valuable way forward. It opens up opportunities for all kinds of learners, especially those in rural or less-resourced areas, by giving them access to quality educational content that might otherwise be out of reach. This flexible model blends the best of both worlds: the convenience and reach of online learning with the personal connection and structure of classroom teaching, and more importantly allowing them to study on their own pace.

15. Enable learning instead of teaching

The focus needs to shift from a teacher-centric model where information is directly transmitted, to a learner-centric model where the learner actively constructs knowledge through exploration, discovery, and application. This approach emphasizes creating environments and providing resources that facilitate learning, rather than solely relying on direct instruction.

Instead of simply delivering information, educators should design activities and provide resources that encourage students to investigate, experiment, and build their own understanding. By developing these skills and mindset to learn independently, students are better prepared to continue learning throughout their lives.

16. Embracing Gamification in Learning

To truly engage today's learners, using game-based elements like rewards, challenges, and progress tracking in educational settings—can make learning more interactive, enjoyable, and motivating. By tapping into students' natural curiosity and love for challenge, gamified learning environments encourage deeper involvement and better retention of concepts. Whether it's through simulations, point systems, or scenario-based tasks, this approach can transform routine lessons into dynamic experiences

17. Embedding Culturally Rooted Training

Culturally rooted training brings local traditions, languages, and community wisdom into the classroom, making education more meaningful and inclusive. This approach not only preserves cultural heritage but also helps learners develop a stronger sense of self while building essential skills for the modern world. It bridges the gap between local knowledge and global competencies

By applying the above recommendations, academic institutions can better prepare IT graduates for the workforce, ensuring they possess the technical, soft and practical skills needed to succeed in a competitive and rapidly changing job market. These initiatives will enhance graduate employability and strengthen the relationship between academia and industry, contributing to the development of a highly skilled workforce.

Recommendations for future research

Future research should explore the following areas to expand upon the insights uncovered:

- **Introducing AI Education in Rural India**

Research could examine how AI-related education and infrastructure can be made accessible to rural schools and colleges. This includes evaluating digital literacy levels, local relevance of AI applications (such as in agriculture or rural healthcare), and the development of cost-effective, vernacular-language AI training modules. Such efforts can help reduce urban migration by empowering rural students with locally applicable, high-value skills.

- **Shifting Student Mindsets in School**

Future studies can investigate the motivational factors that influence students' engagement in school. Understanding how to inspire students to pursue self-development and career goals—beyond merely scoring marks—can transform the learning process. How pilot programs and behavioural research can help uncover the impact of mentorship, real-world projects, and gamified learning on student outlook.

- **Aligning Faculty with Industry Trends**

Research could focus on models for integrating real-time industry knowledge into faculty development. This could include investigating the impact of short-term internships, reverse mentoring (where younger industry professionals train faculty on emerging tools), or digital knowledge hubs that allow for self-paced upskilling. The goal would be to develop scalable, replicable frameworks that can be adopted across institutions.

- **Designing Implementable Government Policies for Academia-Industry Collaboration**

There is a need for research that bridges policy with ground-level implementation. What kind of regulatory models would allow industries to contribute meaningfully to education without compromising academic autonomy? What accountability mechanisms must be in place to ensure that educational institutions act on industry input? Future research could explore comparative case studies, both national and international, to develop policy blueprints that are both aspirational and actionable.

This research has laid the groundwork for understanding the complex interplay between academic preparation and real-world expectations. To drive meaningful change, future research must focus on context-specific, solution-oriented models that promote inclusivity, adaptability, and innovation. Only through such targeted inquiry and collaboration can India build an education system that is not only globally competitive but also deeply rooted in its local realities.

5.5 Conclusions

This research investigates the employability competencies of Information Technology (IT) graduates from Indian universities, specifically assessing how effectively educational institutions prepare students for the workforce. It also seeks to identify the challenges educators and industry stakeholders face in aligning academic curricula with the rapidly evolving demands of the tech sector.

The research uncovered notable problems in providing solutions to fulfil discrepancies between the competencies provided through formal education and those required by industry. Key gaps were observed in technical and soft skills—particularly in programming languages. Students expressed unpreparedness for the job market, while faculty acknowledged the difficulty of keeping curricula aligned with the rapid pace of industry evolution. Industry representatives

stressed the need for significant retraining of graduates, particularly in programming, soft skills and critical thinking areas.

The research provides actionable recommendations for educational institutions to revamp curricula and employ innovative teaching methodologies that meet industry standards. The research highlights the importance of fostering industry partnerships, incorporating internships, and emphasizing soft skills within educational programs to enhance graduate employability.

This study highlights a crucial and growing disconnect between academic preparation and the expectations of the modern workforce—particularly in the field of Information Technology. While India continues to produce a large number of IT graduates each year, many are still struggling to meet industry demands, not due to a lack of potential, but due to a misalignment between what they are taught and what the workplace truly requires.

The practical steps outlined in this study are not just suggestions—they are a call to action. By rethinking how we teach, what we prioritise, and who we involve in the process, academic institutions can begin to close the employability gap. Whether it's improving communication skills, integrating emerging technologies, fostering innovation, or simply giving students more agency in their learning journey, each recommendation plays a vital role in shaping a more capable and confident graduate.

Importantly, these reforms must be student-centred, industry-informed, and culturally aware. When education becomes flexible, inclusive, and grounded in real-world skills, it transforms from a system of instruction into a powerful engine for opportunity and empowerment.

If implemented holistically, these changes can reshape the future of higher education—producing not just degree holders, but well-rounded, industry-ready professionals who can thrive in an ever-evolving digital world.

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APPENDIX A

SURVEY COVER LETTER

Student Viewpoint

This survey is part of a DBA study aimed at understanding student perspectives to enhance academic curriculum design. No personal details will be collected, and all responses will remain anonymous. Your insights will help shape a more effective and industry-relevant education system. Thank you for your participation!

1.Email

Personal Details

2. Name:

3. Gender: (Mark only one oval.)

a) Male

b) Female

c) Prefer Not to Say

4. Which part of India are you originally from (Mark only one oval.)

- Andhra Pradesh
- Arunachal Pradesh
- Assam
- Bihar

- Chhattisgarh
- Goa
- Gujarat
- Haryana
- Himachal Pradesh
- Jharkhand
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- Nagaland
- Odisha
- Punjab
- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttar Pradesh
- Uttarakhand

- West Bengal
- Others: ____

Educational Details

5. In which stream you completed your degree/engineering? (Mark only one oval.)

- Aeronautical
- Automobile
- Chemical
- Civil
- Computer
- Computer Science
- Electrical
- Electrical Electronic and Power
- Electronics
- Electronics & Communication
- Electronics & Telecommunication
- Electrical Electronic
- Instrumentation
- Instrumentation & Control
- IT
- Mathematics
- Mechanical
- Statistics

- Other: ___

6. Completion Year of Degree: ____

7. Your graduation institute was: (Mark only one oval.)

- Government College
- Private College
- Deemed University
- Foreign University

8. How would you describe your academic performance so far? (Mark only one oval.)

- Excellent (Above 80%)
- Good (70-80%)
- Average (60-70%)
- Below Average (Below 60%)

9. What weightage would you give the following in your education?

(Mark only one oval per row.)

	Not at all	Somewhat	Moderately	Highly
Academic knowledge	○	○	○	○
Practical skills	○	○	○	○
Career Opportunities	○	○	○	○

Personal Development (Encouraging creativity, curiosity, and lifelong learning)	○	○	○	○
Certification	○	○	○	○

10. Did your education provide? (Check all that apply.)

- ○ Internships
- ○ Real Life Case Studies
- ○ Industry Visits
- ○ Projects
- ○ Certification
- ○ Other: __

11. How many industry internships or live projects have you completed so far? (Mark only one oval.)

- ○ 3 or more
- ○ 2
- ○ 1
- ○ None

12. To what extent are the following areas covered in your curriculum on a scale of 1 to 5, where 1 = Not Covered and 5 = Covered in Depth (Mark only one oval per row.)

	1	2	3	4	5
Communication and Soft Skills	○	○	○	○	○
Project-based Learning	○	○	○	○	○
Critical Thinking/Problem Solving	○	○	○	○	○
Financial Literacy	○	○	○	○	○
Workplace Behaviour	○	○	○	○	○
Industry Related Knowledge	○	○	○	○	○
Theory Based Knowledge	○	○	○	○	○

Behavioural Questions

13. How confident are you in working in a professional team environment?

(Mark only one oval.)

- ○ Very Confident
- ○ Somewhat Confident
- ○ Not Sure
- ○ Not Confident

14. Are you familiar with the expected behavior in a corporate workspace, including communication, teamwork, problem-solving, adaptability, interpersonal skills, etc

(Mark only one oval.)

- Yes
- Somewhat
- No
- Not sure

15. Do you feel prepared for your first job based on the above

(Mark only one oval.)

- Fully prepared
- Somewhat prepared
- Neutral
- Not prepared

16. Have you ever learned how to deal with anger, frustration, or fear constructively?

(Mark only one oval.)

- Yes, through structured training
- I try on my own
- No, but I want to
- No

17. How do you usually handle failure or criticism? (Mark only one oval.)

- I take it as learning
- I feel demotivated but recover
- I get affected deeply

- I avoid such situations

18. Do you think schools should teach emotional and mental health coping skills? (Mark only one oval.)

- Strongly Agree
- Agree
- Neutral
- Disagree

19. How well do you manage stress during deadlines or exams? (Mark only one oval.)

- Very well
- Manageable
- Poorly
- I panic often

20. Have you had sessions on emotional intelligence, time management, or self-awareness? (Mark only one oval.)

- Yes, in detail
- Briefly
- Not really
- Never

21. Which life skill do you think is most urgent for youth today? (Mark only one oval per row.)

On a scale of 1 to 5, where 1 = Not required and 5 = Most Important

	1	2	3	4	5
Financial Literacy	○	○	○	○	○
Emotional Intelligence	○	○	○	○	○
Career Planning	○	○	○	○	○
Workplace Etiquette	○	○	○	○	○
Social Confidence	○	○	○	○	○
Technical skills (e.g., programming, engineering)	○	○	○	○	○
Digital literacy	○	○	○	○	○
Communication and collaboration	○	○	○	○	○

22. What is your level of preparation in the following skills (Mark only one oval per row.)

	Not at all	Slightly	Somewhat	Moderately	Highly
Emotional Intelligence	○	○	○	○	○
Career Planning	○	○	○	○	○
Team Collaboration	○	○	○	○	○

Social Confidence	○	○	○	○	○
Technical skills (e.g., programming, engineering)	○	○	○	○	○
Digital literacy	○	○	○	○	○
Critical thinking	○	○	○	○	○
Communication	○	○	○	○	○

23. Have you learned about organizational culture, team ethics, or conflict resolution in college? (Mark only one oval.)

- ○ Yes, detailed
- ○ Briefly
- ○ No, but it's needed

24. What qualities do you think matter most at work? (Mark only one oval per row.)

	Not at all	Slightly	Somewhat	Moderately	Highly
Attitude	○	○	○	○	○
Skills	○	○	○	○	○
Communication	○	○	○	○	○
Emotional Intelligence	○	○	○	○	○
Adaptability	○	○	○	○	○
Creative Thinking	○	○	○	○	○
Critical Thinking	○	○	○	○	○

25. Do you think personality development programs should be mandatory in college?

(Mark only one oval.)

- o Strongly Agree
- o Agree
- o Neutral
- o Disagree

26. How confident are you when meeting new people in a professional space?

(Mark only one oval.)

- o Very confident
- o Somewhat confident
- o Neutral
- o Not confident

27. Have you had any formal training in social interaction or networking skills?

(Mark only one oval.)

- o Yes
- o No, but interested
- o No, and not interested

28. Do you feel social confidence impacts your career growth?

(Mark only one oval.)

- Yes, a lot
- Somewhat
- Not sure
- Not at All

29. Have you been encouraged to develop hobbies or creative interests in college? (Mark only one oval.)

- Yes, strongly
- Somewhat
- Rarely
- Never

30. Do you feel pursuing hobbies improves your overall personality and career readiness? (Mark only one oval.)

- Yes, greatly
- Somewhat
- No
- Unsure

31. What other life skills do you believe should be part of school or college education? (Mark only one oval per row.)

	Not Important	Somewhat Not Important	Neutral	Somewhat Important	Very Important
Financial Literacy	○	○	○	○	○
Mental Health Awareness	○	○	○	○	○
Workplace Soft Skills	○	○	○	○	○
Relationship Management	○	○	○	○	○
Entrepreneurial Thinking	○	○	○	○	○
Communication	○	○	○	○	○
Time Management	○	○	○	○	○

32. What is one life skill you wish you had learned earlier in school or college?

33. In your opinion, how well does the college integrate technology into the learning process to prepare students for the digital age

34. In your opinion, what are the primary reasons academic institutions struggle to effectively address the skill gap (e.g., technical, communication, teamwork, problem-solving, adaptability, interpersonal skills) that the industry requires for graduate employability, despite being aware of its importance

35. What do you think is the biggest gap between your academic education and industry expectations?

- Lack of hands-on experience and practical application
- Insufficient focus on soft skills (e.g., communication, teamwork)
- Outdated technical knowledge
- Lack of exposure to industry-specific tools and technologies
- Lack of focus on critical thinking and problem-solving
- Other: ____

36. How satisfied are you with the opportunities to develop skills beyond traditional academic subjects (e.g., internships, projects)?

- Very satisfied
- Satisfied
- Neutral
- Unsatisfied
- Very unsatisfied

37. Which of the following do you believe should be prioritized to better prepare students for the job market? (Mark only one oval.)

- More industry collaborations and internships
- Integration of soft skills training (e.g., teamwork, leadership)
- Incorporation of the latest technologies and tools
- More problem-solving and critical thinking exercises
- More practical, hands-on projects
- Other: ____

38. Did you choose Engineering because you are interested in this field

- Yes
- No

39. Did you choose engineering primarily for job prospects? (Mark only one oval.)

- Yes
- No

40. Did you put in your 100% in the Engineering course (Mark only one oval.)

- Yes
- No

41. Do you believe continuous learning is necessary for career advancement?

(Mark only one oval.)

- True
- False

Industry Perspective: Based on Engineering

This survey is part of a DBA study aimed at understanding industry perspectives to enhance academic curriculum design (Specifically for Engineering). No personal details will be collected,

and all responses will remain anonymous. Your insights will help shape a more effective and industry-relevant education system.

We want to understand why many engineering graduates lack key job skills like communication, teamwork, and problem-solving, even though these are essential for success. This study looks at why this gap exists despite academia knowing about it.

Thank you for your participation!

1. Email

2. Name

3. Gender: (Mark only one oval.)
   - Male
   - Female
   - Prefer not to say
4. What is your highest educational qualification?

5. Your Skillset:

6. Organization you are working in:

7. Years of Experience:

8. What is your role in the organization? (Mark only one oval.)

- Senior Developer
- Team Lead
- Hiring Manager
- Senior Executive
- HR Professional
- Other: _____

9. How many years of experience do you have in your industry?
    - Less than 5 years
    - 5–10 years
    - 10–20 years
    - More than 20 years

10. In your experience, how well-prepared are fresh graduates for industry roles in terms of technical skills?
    - Not prepared
    - Somewhat prepared
    - Prepared but not confident
    - Highly prepared

11. How would you rate fresh graduates on soft skills such as communication, teamwork and problem-solving?
    - Very Weak

- Weak
- Average
- Good
- Excellent

12. What key skills do you find lacking in most fresh graduates? *(Mark only one oval per row)*

Skill	Not Lacking	Slightly Lacking	Significantly Lacking	Critically Lacking
Technical Expertise	☐	☐	☐	☐
Critical Thinking	☐	☐	☐	☐
Communication	☐	☐	☐	☐
Innovation & Creativity	☐	☐	☐	☐
Adaptability	☐	☐	☐	☐
Team Collabration	☐	☐	☐	☐
Digital Literacy	☐	☐	☐	☐

13. How aligned do you think the current academic curriculum is with industry needs? (Mark only one oval.)

- Not Aligned
- Somewhat Aligned

- Aligned but needs improvement
- Highly Aligned

14. What improvements would you suggest for academic institutions to better align with industry expectations?

15. Do you believe faculty members have a clear understanding of current industry requirements?
    - Yes
    - No
    - Maybe

16. Have you or your organization collaborated with academic institutions for curriculum development, guest lectures, internships or skill training programs?
    - Yes
    - No
    - Other: _____

17. What initiatives could bridge the gap between academic learning and industry expectations? *(Mark only one oval per row)*

Initiative	Very Effective	Effective	Neutral	Ineffective

Internships	☐	☐	☐	☐
Industry-driven Projects	☐	☐	☐	☐
Certification Programs	☐	☐	☐	☐
Faculty Training by Industry Experts	☐	☐	☐	☐

18. Would your organization be open to participating in structured academia-industry collaboration programs?
    - Yes
    - No

19. Any additional comments or suggestions on improving graduate employability and curriculum alignment?

20. What are the key challenges academic institutions face in bridging the gap between academic learning and industry expectations?

21. How do you think CSR funds can be utilized to enhance industry-academia collaboration? *(Check all that apply)*
    - Funding for industry-driven projects
    - Establishing advanced labs & research centers
    - Sponsoring student internships & apprenticeships
    - Faculty training programs

- Organizing industry-academic networking events
- Other: _____

22. What type of CSR-driven academic initiatives do you think would have the most impact?

23. What specific initiatives would you suggest for improving graduate employability through industry-academia collaboration?

24. What are the biggest obstacles preventing effective industry-academia collaboration?

25. What role should industry play in helping academic institutions prepare students for employment? *(Check all that apply)*
    - Curriculum development programs
    - Internship opportunities
    - Mentorship programs
    - Faculty training
    - Research collaboration
    - Funding for skill development initiatives
    - Other: _____

26. In your opinion, what policy changes or initiatives could strengthen industry-academia collaboration?

APPENDIX B

INFORMED CONSENT

EMPLOYABILITY SKILLS OF INFORMATION TECHNOLOGY UNIVERSITY GRADUATES IN INDIA

You are invited to participate in a research study being conducted for a dissertation at Swiss School of Business and Management. The study is interested in your thoughts and opinions about how educational and employability reforms, alongside policy interventions, can contribute to equipping IT university graduates with skills aligned with employer demands in India.

You were selected because you satisfied the main categories of criteria (i.e., Student, Faculty, Industry and Experts). There is no deception in this study.

You will be asked to answer some questions during the interview process about how the employability skill. It is estimated that the interview will last between 30 to 45 minutes. The following people are involved in this research study and may be contacted at any time: Nidhi Poddar, a doctoral candidate, and Ivica Katavic, PhD, a dissertation mentor.

Although there are no known risks in this study, you can also choose not to answer any question that you feel uncomfortable in answering.

There are no direct benefits to you of participating in this research. No incentives are offered. The results will have applied interest that may eventually have benefits for your company/institutions and its primary and secondary stakeholders.

The data collected in this study is confidential. Your name or personal information is not linked to data. Only the researcher in this study will see the data. You have the right to withdraw from the study at any time without penalty.

We would be happy to answer any question that may arise about the study. Please direct your questions or comments to: Nidhi Poddar, (yashnidhi@gmail.com; 9324095272) and Ivica Katavic (ivica@ssbm.ch; + 385 99 369 5585).

Signatures

I have read the above description for Employability skills of information technology university graduates in India.

I understand what the study is about and what is being asked of me. My signature indicates that I agree to participate in the study.

Participant's Name: _____

Researcher’s Name: Nidhi Poddar

Participant's Signature: _____

Researcher's Signature: _____

Date: _____

APPENDIX C

INTERVIEW GUIDE

Course Coordinator Viewpoint

This interview is part of a **DBA study** aimed at understanding faculty perspectives to enhance academic curriculum design. Your insights will help shape a more effective and industry-relevant education system.

We want to understand why many **engineering** graduates lack key job skills like communication, teamwork, and problem-solving, even though these are essential for success. **This study looks at why this gap exists despite academia knowing about it.**

Thank you for your participation!

1. Email:

2. Name:

3. What is your highest educational qualification?

4. Your Skillset:

5. What is your current job role?

6. Institute/ Organization you are working in

7. Your Institution is:

8. Years of Experience:

9. Which digital tools do you use for teaching?

10. Do you use online learning platforms (e.g., Coursera, Udemy, edX) to supplement your teaching?

11. How frequently do you update your course content based on industry needs?

12. How do you gauge the industry need?

13. How do you keep yourself updated with changes in the IT industry?

14. What are the biggest challenges in staying updated with IT trends?

15. Which new IT technologies have you recently introduced your students to

16. What institutional support would help you better adapt to IT changes?

17. Have you observed changes in student's learning preferences with

emerging technologies?

18. What are the changes you have observed in students' learning preferences with emerging technologies?

19. What teaching strategies have you adopted to enhance student engagement?

20. Do your students have opportunities to work on real-world projects with industry collaboration?

21. How do you assess students' industry readiness?

22. Which skills do students most often lack upon graduation?

23. Do you invite industry professionals for guest lectures or workshops?

24. Do you believe IT students should obtain industry-recognized certifications (AWS, Cisco, Microsoft) before graduation?

25. What areas need greater emphasis in academic delivery?

	Not Important	Slightly Important	Neutral	Important	Very Important
Financial & Tax Literacy	○	○	○	○	○
Communication & Soft skills	○	○	○	○	○
Workplace Behaviour (Discipline & Time Management)	○	○	○	○	○
Interpersonal & Teamwork Skills	○	○	○	○	○
Problem -Solving and Critical Thinking	○	○	○	○	○
Emotional Intelligence & Stress Handling	○	○	○	○	○
Technology Driven Learning (AI/Cloud/Data Science)	○	○	○	○	○
Ethical And Responsible AI Use	○	○	○	○	○

26. Would you be open to designing industry-integrated programs (e.g., Minor/Major tracks, Finishing School)?

27. How should CSR funds be utilized for academic upliftment?

28. What major change would you suggest to align the current curriculum with industry needs?

29. What are the biggest obstacles to incorporating life skills into core education?

30. Any additional insights or suggestions to make the institution more industry-aligned?

31. Can you describe a teaching method or project that has best prepared students for real-world IT challenges?

32. What kind of institutional support would help you teach more effectively in line with modern industry demands?

33. What future IT trends or skills should be introduced into the curriculum, and why? Anything Specific Observations you would like to point out