



An assessment of graduate readiness in the 21st century workforce

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Abstract

The 21st-century workforce demands a dynamic set of skills beyond academic knowledge, including communication, problem-solving, digital literacy, teamwork, and adaptability. This research assesses the readiness of higher education graduates to meet these evolving demands. Employing a mixed-method research approach, data were collected from 250 final-year students across higher education institutions in Uttarakhand through structured questionnaires and interviews with 20 industry professionals and faculty members. Results reveal a moderate level of readiness among graduates, with significant gaps in soft skills, industry exposure, and digital competencies. The paper recommends curricular reforms, industry-institution linkages, and enhanced career readiness programs to bridge the existing gap between academia and industry.

Keywords: Graduate readiness, employability, 21st-century skills, higher education, skill gap, uttarakhand, workforce preparedness

Introduction

The transition from education to employment is one of the most critical phases in an individual's life, marking the shift from academic learning to professional engagement. In the 21st century, this transition has become increasingly complex due to the rapidly changing nature of work, driven by technological advancements, globalization, and shifting employer expectations. The demands of the modern workforce now extend far beyond domain-specific knowledge, emphasizing a range of skills such as critical thinking, creativity, communication, collaboration, adaptability, and digital literacy. These are collectively known as "21st-century skills," and they form the bedrock of employability in today's competitive job market. In recent years, concerns have grown regarding the employability of graduates, particularly in developing regions where higher education systems struggle to keep pace with industry demands. In India, the issue of graduate unemployability has been well documented. According to the India Skills Report 2023, only 50% of Indian graduates are considered employable by industry standards. The problem is especially pronounced in states like Uttarakhand, where higher education institutions face unique regional and structural challenges, including limited access to industry, faculty shortages, and infrastructural constraints. While the number of degree holders continues to increase, the question remains: Are these graduates truly ready for the 21st-century workforce? Uttarakhand, a Himalayan state with a diverse educational landscape, is home to several public and private universities, technical institutions, and colleges. While the gross enrolment ratio (GER) in higher education has improved significantly, the region faces an acute mismatch between academic outputs and market needs. The traditional curriculum, often rigid and theoretical, fails to adequately prepare students for real-world employment. Additionally, there is limited focus on skills such as communication, teamwork, emotional intelligence, digital competence, and problem-solving, which are now fundamental for success in the workplace.

The 21st-century workforce is characterized by its dynamic, digital, and global nature. Organizations are increasingly

looking for employees who are not only technically proficient but also emotionally intelligent, culturally aware, and capable of continuous learning. The rise of automation, artificial intelligence, and remote work has redefined job roles and the skillsets required to perform them effectively. In this context, the readiness of graduates their ability to transition smoothly into the workforce and contribute meaningfully has emerged as a crucial area of inquiry for educators, policymakers, and industry leaders alike. Graduate readiness, also referred to as employability, involves a combination of knowledge, skills, attitudes, and behaviours that enable a graduate to obtain employment and perform effectively in the workplace. It includes core competencies such as subject expertise, but also encompasses transferable skills, workplace ethics, adaptability, and a proactive approach to learning. Yorke and Knight (2004) [25] define employability as "a set of achievements skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations." The multidimensional nature of employability highlights the need for an integrated approach to teaching, learning, and assessment in higher education. In the Indian context, the National Education Policy (NEP) 2020 recognizes the growing importance of employability and skill development in higher education. It emphasizes a holistic and multidisciplinary approach to education, integrating vocational training, internships, soft skills development, and critical thinking into academic curricula. However, the practical implementation of these reforms, especially in rural and semi-urban areas like Uttarakhand, remains a major challenge. Institutional inertia, lack of industry collaboration, limited faculty exposure, and resource constraints hinder the development of employability-oriented educational ecosystems.

Several studies have attempted to assess the employability skills of Indian graduates, revealing consistent gaps between academic training and employer expectations. Employers often report dissatisfaction with graduates' communication abilities, problem-solving skills, and work readiness. Moreover, there is a perception that many graduates lack

confidence, adaptability, and real-world exposure, which significantly impairs their ability to thrive in competitive work environments. In regions like Uttarakhand, the lack of structured career guidance, limited exposure to industrial practices, and inadequate internship opportunities further compound the problem. Given this background, the current research seeks to conduct a comprehensive assessment of graduate readiness in the 21st-century workforce, with a specific focus on higher education institutions in Uttarakhand. The study aims to examine the extent to which graduates possess the skills and attributes required for successful employment and professional growth. It also explores the perceptions of key stakeholders including students, faculty, and employers to identify gaps, challenges, and opportunities for reform. This research is significant for several reasons. First, it addresses a pressing national concern graduate unemployment by generating region-specific insights that can inform policy and institutional practices. Second, it aligns with global discussions on future-ready education and lifelong learning in the digital age. Third, by focusing on Uttarakhand, the study sheds light on the distinctive challenges faced by hilly and semi-urban regions, which are often overlooked in national policy discourses.

Literature Review

Yorke and Knight (2004) [25] emphasize that employability is not just about getting a job but is a combination of achievements, understandings, and personal attributes that make individuals likely to gain and sustain employment. Harvey (2005) [7] argues that universities must go beyond knowledge delivery to cultivate transferable skills and reflective learning, which are central to long-term employability. Tomlinson (2008) [22] highlights that students see employability as an active process involving skill acquisition, internships, and social capital building, not just a product of education. Jackson (2016) [9] stresses the importance of pre-professional identity in shaping employability, showing that students who engage early with industry-oriented tasks are better prepared. Andrews and Higson (2008) [1] found that employers often perceive graduates as lacking in soft skills, particularly communication and problem-solving, despite academic achievements. Suleman (2018) [20] argues that graduate employability should include not only technical and soft skills but also emotional intelligence and self-management. Bridgstock (2009) [4] proposes that career management and lifelong learning should be embedded in education to improve employability outcomes. Knight and Yorke (2003) [10] recommend the USEM model (Understanding, Skills, Efficacy beliefs, and Metacognition) for integrating employability in curriculum design. Srivastava and Agarwal (2017) [19] find that Indian graduates often lack industry exposure, which hampers their readiness despite formal education. Confederation of Indian Industry (CII) & Wheebox (2023) [24] report that only 50% of Indian graduates are employable, with communication and digital literacy being major areas of concern. Bhandari (2018) [3] suggests that Indian universities must modernize teaching strategies and build stronger industry-academia linkages. NASSCOM (2021) [12] notes that future employability depends on AI-readiness, adaptability, and hybrid skill sets in tech and humanities. Archer and Davison (2008) [2] emphasize employer dissatisfaction with graduate

performance in real-world scenarios despite academic excellence. Pandey and Pandey (2020) [13] argue for regional reforms in states like Uttarakhand to tailor education to local industry needs and youth aspirations. Rao and Joshi (2019) [16] find that the incorporation of internships and project-based learning significantly improves graduate job-readiness. Dhawan and Roy (2021) [6] analyse the post-COVID impact on employability, highlighting a digital divide and unequal access to career resources. Patil and Kodag (2020) [14] recommend incorporating vocational skills and digital literacy into UG curricula across Indian universities. Paul and Mukhopadhyay (2022) [14] observe that students in Tier-2 and Tier-3 cities lack awareness about employability skills and career readiness programs. Sharma (2021) [18] points out the lack of structured career counselling in Indian HEIs as a major barrier to skill development. UNESCO (2022) [23] underscores the importance of future-ready education that combines cognitive, digital, and emotional skills for sustainable careers. Teichler (2011) [21] emphasizes the widening gap between higher education systems and labour market needs in many countries, including developing economies, stressing the importance of aligning education with occupational realities. Mason, Williams, and Cranmer (2009) [11] find that work experience and employer engagement during higher education significantly influence graduate employment outcomes, more so than academic performance alone. Rothwell and Arnold (2007) [17] introduce the concept of "perceived employability," noting that students' confidence in their ability to find work is shaped by both personal capabilities and institutional support. Dacre Pool and Sewell (2007) [5] developed the CareerEDGE model of graduate employability, which includes emotional intelligence, career development learning, and reflection as key pillars of workforce readiness. Hillage and Pollard (1998) [8] provide an early framework for employability in the UK context, defining it as the capability to gain initial employment, maintain it, and move to new employment if required.

Objectives of the Study

1. To assess the current level of employability skills among graduates of higher education institutions in Uttarakhand.
2. To evaluate the alignment between academic training and industry expectations.
3. To identify institutional and structural challenges affecting graduate readiness.
4. To recommend strategies to bridge the gap between education and employment.

Research Methodology

This research employs a mixed-method approach combining both quantitative and qualitative methods to assess graduate readiness for the 21st-century workforce in Uttarakhand's higher education institutions.

Sampling

A purposive sampling technique is used to select participants from final-year undergraduate students, faculty members, placement officers, and employers across five higher education institutions in Uttarakhand. Stratified random sampling ensures that student participants are representative across different disciplines (Arts, Science,

Commerce, and Professional courses). A total of 250 students and 20 faculty members/employers will be involved in the study. The study's geographic focus includes institutions in five key districts: Dehradun, Haridwar, Nainital, Almora, and Pauri, ensuring diverse representation.

Data Collection Methods

For the quantitative component, data will be collected using a structured questionnaire, administered both online (via Google Forms) and offline. The questionnaire will cover key employability skills, including communication, teamwork, problem-solving, and digital literacy, and will use a 5-point Likert scale to assess student self-perceptions. The qualitative component will involve semi-structured interviews with 10 employers and 10 faculty members/placement officers. These interviews will explore deeper insights into industry expectations, graduate skill gaps, and academic readiness. The qualitative data will be transcribed and analysed thematically, allowing for a deeper understanding of the contextual factors influencing graduate employability. Both methods are designed to provide comprehensive data, combining objective skill assessments with subjective insights into the challenges and expectations related to graduate readiness. This dual approach ensures a robust understanding of the skill gaps and areas for improvement, informing strategies to better align education with industry needs.

Findings and Discussion

Communication Skills Are Relatively Strong

The data revealed that most students rated themselves highly in basic communication skills such as written and verbal expression, with an average score of 4.03 out of 5. This reflects the effectiveness of traditional academic structures that emphasize report writing and classroom presentations. However, feedback from employers often highlights a gap in public speaking, persuasive communication, and real-time workplace dialogue. While students feel confident, there is a need to enhance their communication agility especially in cross-cultural and digital settings.

Implication: Institutions must incorporate simulated interviews, group discussions, and real-time speaking opportunities into the curriculum.

High Competency in Teamwork and Collaboration

Students showed a strong ability to work in teams (average score: 4.13), indicating comfort in cooperative environments. This is likely due to the rise of project-based learning and peer assignments. Students acknowledged their ability to collaborate with peers from diverse backgrounds, a crucial asset for globalized workplaces.

Implication: Educators should leverage this strength by integrating interdisciplinary group tasks that mimic corporate team structures.

Moderate Ability in Problem-Solving and Critical Thinking

While students demonstrated a fair understanding of logical thinking and decision-making (mean score: 3.78), they often lacked confidence in solving complex, ambiguous problems

especially under pressure. This may stem from a rote-based learning system that limits the cultivation of analytical reasoning and innovation.

Implication: Introducing case studies, open-ended problems, and hackathons could build resilience and adaptive problem-solving.

Digital Literacy Needs Enhancement

With a mean score of 3.60, students appear digitally literate in basic applications such as MS Office or browsing tools. However, they lack advanced proficiency in tools related to data analysis, digital marketing, or domain-specific software. This digital gap is a critical obstacle in an economy increasingly driven by automation and remote work.

Implication: Institutions must design specialized digital literacy programs in collaboration with industry experts, tailored by discipline.

Self-Management and Adaptability Are Developing

Self-discipline, time management, and emotional adaptability scored relatively well (3.93). Students indicated a readiness to meet deadlines and take initiative. However, qualitative responses reflected a struggle in managing failure, peer pressure, and unclear expectations—suggesting a need for resilience training.

Implication: Soft skills like emotional intelligence, stress management, and feedback reception must be formally embedded into student development programs.

Career Awareness and Planning Is Weakest

The lowest average score (3.50) was recorded in career awareness and planning. Many students admitted limited knowledge of current industry expectations, potential career paths, or required skill sets. This aligns with global concerns about the disconnect between academic institutions and the job market.

Implication: Strengthening career guidance cells, mentorship programs, and alumni interactions can provide critical exposure to real-world career trajectories.

Role of Internships and Skill Development Programs

Students who had undertaken internships or skill enhancement programs scored significantly higher across several categories particularly in career planning and problem solving. This correlation affirms that experiential learning fosters better preparedness.

Implication: Institutions should make internships mandatory and collaborate with industries for structured exposure and feedback mechanisms.

Conclusion

The findings highlight that while graduates in Uttarakhand possess foundational employability skills, their readiness for the 21st-century workforce remains incomplete. Strengths in communication and teamwork are promising, but deficits in digital competency, career planning, and critical thinking must be urgently addressed. A more industry-integrated, skill-focused, and personalized approach to higher education

is needed to ensure graduates not only find employment but thrive in dynamic professional environments.

Policy Implications

- The study highlights critical gaps in graduate employability across higher education institutions in Uttarakhand, necessitating strategic policy reforms. To address this, employability skill development must be integrated into undergraduate curricula, focusing on communication, problem-solving, digital literacy, and career planning. Mandatory internships and industry-driven projects should be institutionalized, with academic credits and structured mentorship.
- Career counseling cells need to be established in every college, offering students access to guidance, psychometric tools, and job market insights. Additionally, digital skills training, particularly in rural areas, must be expanded through platforms like SWAYAM and Skill India.
- To bridge academia-industry gaps, colleges should collaborate with local industries for internships and placements. Faculty development programs focusing on 21st-century pedagogy and mentoring are essential to sustain these changes.
- A Graduate Employability Index (GEI) should be introduced at the state level to track institutional performance, supported by annual employability audits. Lastly, a dedicated task force comprising educators, policymakers, industry experts, and alumni should drive continuous reforms to align education with workforce needs.

Reliability and Limitations

The study maintains reliability through standardized questionnaires and consistent data collection methods. However, limitations include a relatively small and region-specific sample, which may not represent all graduates across India. Self-reported responses may introduce bias, and the absence of employer feedback limits external validation. Despite these constraints, the findings offer valuable insights into employability gaps in Uttarakhand's higher education system.

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