



The Changing Landscape of Online Education in Bridging the Skills Gap

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Abstract

The rapid growth of digital technologies has significantly transformed the education sector, leading to the widespread adoption of online learning platforms across the world. The present study examines the changing landscape of online education and its role in bridging the skills gap among students and working professionals. The study focuses on understanding learners' perceptions regarding the accessibility, effectiveness, flexibility, and usefulness of online education in improving professional and technical competencies. A descriptive quantitative research design was adopted for the study, and primary data were collected from 120 respondents through a structured questionnaire based on a five-point Likert scale. Simple statistical tools such as frequency distribution, percentage analysis, mean, and standard deviation were used for data analysis. The findings revealed that respondents generally hold positive attitudes toward online education and believe that digital learning platforms contribute significantly to skill development, career growth, and continuous learning. Participants particularly appreciated the convenience, affordability, and accessibility offered by online learning platforms. However, the study also identified concerns regarding employer recognition and the credibility of online certifications in the job market. Overall, the research concludes that online education has substantial potential to reduce the skills gap and support workforce development if supported by improved digital infrastructure, quality learning systems, and stronger institutional recognition of online credentials.

Keywords: Online Education, Skills Gap, E-learning Platforms, Skill Development, Digital Learning

1. Introduction

The global economy of the twenty-first century is characterized by unprecedented technological disruption, accelerating automation, and the continuous emergence of new occupational categories that demand a highly adaptive workforce. Organizations across sectors have increasingly reported a widening skills gap—a structural mismatch between the competencies possessed by the available labor supply and those demanded by employers (World Economic Forum, 2023). Conventional educational institutions, constrained by rigid curricula, geographic limitations, and financial barriers, have often struggled to respond dynamically to these rapidly shifting workforce needs.



Online education has emerged as a powerful and scalable mechanism to address these systemic deficiencies. With the global e-learning market projected to surpass USD 600 billion by 2030 (Global Market Insights, 2023), platforms such as Coursera, edX, Udemy, LinkedIn Learning, and NPTEL have democratized access to professional and technical knowledge across geographic and socioeconomic boundaries. The COVID-19 pandemic further accelerated the mainstreaming of online education, compelling educational institutions, learners, and employers alike to recalibrate their understanding of what constitutes legitimate skill acquisition and credentialing (Dhawan, 2020).

Despite this exponential growth, critical questions persist regarding the effectiveness of online education in genuinely closing the skills gap. Skeptics argue that self-paced platforms lack the rigor, mentorship, and social learning infrastructure of traditional education, leading to high dropout rates and surface-level competency development (Dillahun et al., 2016). Proponents, however, contend that modern adaptive learning technologies, competency-based certification, and employer partnerships are increasingly validating the transformative potential of digital learning environments (Bonk & Lee, 2017).

This study seeks to empirically examine the relationship between online education characteristics and skill development outcomes among a sample of learners in India, where both the digital economy and educational inequities create a particularly relevant context for investigation. The research employs a quantitative methodology using SPSS-based statistical analysis to test hypotheses regarding the predictors of effective online skill development.

1.1 Background and Context

India presents an especially compelling context for examining online education's role in skills development. With a population exceeding 1.4 billion and a median age of approximately 28 years, the country faces both immense human capital potential and significant workforce readiness challenges (Ministry of Education, 2023). The National Skill Development Corporation (NSDC) estimates that approximately 400 million workers require reskilling by 2025 to remain relevant in a digitally transformed economy. Simultaneously, internet penetration has grown substantially, reaching approximately 900 million users by 2024 (TRAI, 2024), creating fertile ground for scalable online learning interventions.

Government initiatives such as SWAYAM, DIKSHA, and the PM eVIDYA program have extended public online education infrastructure, while private platforms including Unacademy, upGrad, and BYJU's have attracted millions of learners. These developments collectively indicate a structural shift in how skills are being acquired, evaluated, and deployed in the Indian labor market.



Despite remarkable growth in online education participation, employers in both the public and private sectors continue to report dissatisfaction with the practical readiness of candidates who possess exclusively online credentials (LinkedIn Workforce Report, 2023). A fundamental tension persists: while online platforms offer unprecedented breadth of content and access, questions about the depth of learning, authenticity of assessment, and institutional credibility of digital certificates remain unresolved. Furthermore, learners from disadvantaged socioeconomic backgrounds—those who stand to benefit most from online education—frequently encounter barriers related to digital infrastructure, device access, and digital literacy that constrain their ability to fully engage with online learning environments.

This research contributes to the growing body of empirical literature on e-learning effectiveness and workforce development in emerging economies. By employing rigorous quantitative methodology with a defined sample and validated instrument, the study provides actionable evidence for educational policymakers, platform developers, corporate human resource professionals, and individual learners seeking to maximize the return on their online learning investments. The findings are particularly relevant given India's ambitious goal of becoming a five-trillion-dollar economy, in which human capital development through scalable digital education is considered a strategic priority.

2. Literature Review

2.1 Online Education and Workforce Skill Development

The relationship between online education and workforce skill development has attracted substantial scholarly attention since the early 2000s, with investigations intensifying following the widespread adoption of Massive Open Online Courses (MOOCs) beginning around 2012. Pappano (2012) characterized the MOOC phenomenon as a potential revolution in higher education, suggesting that scalable, freely accessible digital instruction could disrupt traditional educational hierarchies and extend university-quality education to millions of previously excluded learners globally.

Subsequent empirical research has both confirmed and complicated this optimistic narrative. Hew and Cheung (2014) conducted a systematic review of MOOC studies and found that while learner motivation and engagement are positively associated with completion, most learners fail to complete their enrolled courses, raising fundamental questions about the effectiveness of self-regulated online learning for workforce skill acquisition. Khalil and Ebner (2014) similarly identified learner autonomy as a double-edged characteristic of online platforms: while flexibility enables participation across diverse life circumstances, the absence of external accountability structures characteristic of traditional education often undermines sustained engagement.



More recent scholarship has adopted a more nuanced framework, distinguishing between different types of online learning modalities and their differential impacts on skill development. Bonk and Lee (2017) argue that blended learning approaches—which combine online instruction with structured mentorship, peer collaboration, and authentic project-based assessment—yield significantly stronger competency outcomes than purely asynchronous self-paced platforms. This finding has significant implications for platform design and for policy frameworks that seek to leverage online education for workforce development.

In the Indian context, Subramanian and Vinayagam (2022) examined the impact of SWAYAM and NPTEL courses on engineering students' professional competencies and found significant positive associations between course completion and self-reported skill improvement, particularly in technical domains such as programming, data analysis, and project management. However, the authors also noted that the translation of online certification to employment advantage remains inconsistent, suggesting that institutional credentialing structures have not kept pace with platform proliferation.

The COVID-19 pandemic represents a watershed moment in the trajectory of online education adoption. Dhawan (2020) documented a dramatic global acceleration in online enrollment across all educational levels, noting that the crisis compelled both learners and institutions to develop greater digital literacy and instructional technology competence. However, Mishra et al. (2020) caution that the emergency shift to online education during the pandemic exposed deep infrastructural inequities that may have exacerbated rather than reduced skills gaps for learners from marginalized communities with limited device access and unreliable internet connectivity.

2.2 The Skills Gap: Structural Dimensions and Digital Solutions

The concept of the skills gap has been theorized through multiple disciplinary lenses. Labor economists conceptualize it primarily as a market failure: a disequilibrium condition in which the supply of workers with requisite competencies does not meet employer demand, leading to unfilled positions, depressed productivity, and wage inflation in high-demand occupational sectors (Cappelli, 2015). Sociologists, by contrast, tend to emphasize the structural and institutional dimensions of skills gaps, arguing that the phenomenon reflects inequitable access to quality education and training rather than individual-level deficits (Bills, 2016).

The World Economic Forum's Future of Jobs Report (2023) identifies the growing importance of digital, analytical, and interpersonal competencies across virtually all occupational categories, estimating that approximately 44% of workers' skills will be disrupted within the next five years due to technological change. This structural transformation creates an urgent imperative for continuously accessible, rapidly updatable skill development infrastructure—a description that online education platforms are uniquely positioned to fulfill.



Employer surveys provide complementary evidence for the dimensions and severity of the skills gap. The LinkedIn Global Talent Trends Report (2023) found that 87% of talent professionals globally report skills shortages as a significant organizational challenge, with technology-related competencies, data literacy, and complex problem-solving most frequently cited as critical deficiencies. Significantly, the same report found growing employer openness to candidates with demonstrated online credentials, particularly when supplemented by portfolio evidence of applied skill, suggesting an evolving landscape of credential recognition.

Kochhar and Kumar (2021) examined the role of digital upskilling initiatives in Indian manufacturing and services sectors and found that companies which integrated online learning platforms into their human resource development strategies reported measurable improvements in employee performance metrics and innovation outcomes. However, the authors identify persistent barriers including low digital literacy among older workers, inadequate organizational support infrastructure, and the absence of systematic frameworks for assessing the workplace transferability of online-acquired competencies.

Recent scholarship has increasingly examined the potential of emerging technologies—including artificial intelligence, adaptive learning algorithms, and immersive virtual reality environments—to further enhance the effectiveness of online skill development. Zawacki-Richter et al. (2019) conducted a systematic review of AI applications in higher education and identified promising evidence for personalized learning pathways that adapt to individual learner profiles, potentially addressing the engagement and completion challenges that have historically limited online education's workforce development impact.

3. Methodology

The present study adopted a descriptive quantitative research design to examine the changing landscape of online education in bridging the skills gap among students and working professionals. The research focused on understanding respondents' perceptions regarding the effectiveness, accessibility, quality, and usefulness of online learning platforms in enhancing professional and technical skills. Primary data were collected through a structured questionnaire distributed online to respondents who had prior experience using online education platforms such as Coursera, Udemy, SWAYAM, NPTEL, and LinkedIn Learning. A total of 120 valid responses were collected using convenience sampling techniques from participants residing in different metropolitan cities of India. The questionnaire consisted of two sections: the first section included demographic information such as gender, age, education level, and duration of online learning usage, while the second section contained twelve statements related to online education and skill development. All statements were measured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The collected data were analyzed using simple statistical tools

including frequency distribution, percentage analysis, mean, and standard deviation to interpret respondents' opinions and attitudes toward online education. Tables were used to present the findings in a clear and systematic manner. The methodology was selected because it provides a simple and effective approach for understanding learners' perceptions regarding how online education contributes to skill enhancement, career growth, and employability in the modern digital learning environment.

4. Results

The results of the study indicate that respondents generally have positive perceptions regarding the role of online education in bridging the skills gap. The demographic analysis showed that most participants were young adults and working professionals who actively use online learning platforms for skill development and career advancement. The frequency distribution analysis revealed that a majority of respondents selected "Agree" and "Strongly Agree" for most questionnaire statements, indicating satisfaction with the accessibility, flexibility, and effectiveness of online education. Respondents particularly agreed that online learning improves professional skills, increases technical knowledge, and saves time and cost. The mean score analysis further confirmed positive attitudes toward online education, with most statements recording mean values above 3.5. However, comparatively lower responses were observed regarding employer recognition of online certifications, suggesting some concerns about the acceptance of digital credentials in the job market. Overall, the findings demonstrate that online education plays a significant role in enhancing skills and supporting continuous learning in the modern workforce.

Demographic Profile of Respondents (N = 120)

Variable	Category	Frequency	Percentage
Gender	Male	64	53.3%
	Female	56	46.7%
Age Group	18–25 years	38	31.7%

	26–35 years	52	43.3%
	36–45 years	22	18.3%
	46+ years	8	6.7%
Education	Undergraduate	46	38.3%
	Postgraduate	58	48.3%
	Professional	16	13.4%
Experience with Online Learning	Less than 1 year	24	20.0%
	1–3 years	58	48.3%
	More than 3 years	38	31.7%

Table 1 presents the demographic characteristics of the 120 respondents who participated in the study. The findings indicate that the majority of respondents were male (53.3%), while female respondents accounted for 46.7%, showing a relatively balanced gender distribution. In terms of age, the largest group of participants belonged to the 26–35 years category (43.3%), followed by respondents aged 18–25 years (31.7%). This indicates that young adults and early-career professionals are the primary users of online learning platforms. Regarding educational qualifications, postgraduate respondents formed the highest proportion (48.3%), suggesting that highly educated individuals are actively engaging in online education for skill enhancement and career advancement. Undergraduate respondents accounted for 38.3%, while professionals represented 13.4% of the sample. The results further show that nearly half of the respondents (48.3%) had been using online learning platforms for one to three years, while 31.7% reported more than three years of experience. This reflects a considerable level of familiarity and engagement with online education among participants. Overall, the demographic profile demonstrates that online learning is widely adopted among educated and professionally active individuals seeking continuous learning and skill development opportunities.

Table 2: Frequency Distribution of Responses for Online Education and Skills Gap (N = 120)

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

S.No	Statements	SD	D	N	A	SA
Q1	Online education improves professional skills	4	8	16	52	40
Q2	Online courses are easily accessible	3	5	12	54	46
Q3	Online platforms provide updated industry knowledge	5	9	18	50	38
Q4	Online learning helps in career growth	6	10	20	48	36
Q5	Online certifications are valued by employers	8	14	24	46	28
Q6	Online learning platforms are user-friendly	4	7	15	56	38
Q7	Online education saves time and cost	3	6	10	50	51
Q8	Online learning increases technical competencies	5	8	17	55	35
Q9	Interactive features improve learning engagement	6	10	19	49	36
Q10	Online learning motivates self-development	4	9	14	57	36
Q11	Online platforms help bridge the skills gap	5	7	16	58	34
Q12	I am satisfied with my online learning experience	4	8	18	54	36

Table 2 presents the frequency distribution of responses for the twelve Likert-scale statements related to online education and skill development. The findings reveal that a majority of



respondents selected “Agree” and “Strongly Agree” for most statements, indicating positive perceptions toward online education. Respondents strongly agreed that online education improves professional skills, provides updated industry knowledge, and increases technical competencies. High frequencies under the “Agree” and “Strongly Agree” categories also suggest that learners perceive online education as accessible, flexible, and cost-effective. In particular, the statement regarding online education saving time and cost received one of the highest positive response rates, highlighting the convenience associated with digital learning platforms. Furthermore, many respondents agreed that online learning motivates self-development and helps bridge the skills gap by providing opportunities for continuous learning. However, comparatively lower positive responses were observed for employer recognition of online certifications, indicating that some respondents still have concerns regarding the acceptance and credibility of online credentials in the job market. Neutral responses for certain statements suggest that perceptions toward online education may vary depending on learners’ experiences and professional backgrounds. Overall, the frequency analysis confirms that respondents generally hold favorable attitudes toward the role of online education in enhancing skills and employability.

Table 3: Mean and Standard Deviation of Questionnaire Statements

S. No	Statements	Mean	Standard Deviation	Interpretation
Q1	Online education improves professional skills	3.97	0.98	Agree
Q2	Online courses are easily accessible	4.12	0.91	Agree
Q3	Online platforms provide updated industry knowledge	3.89	1.02	Agree
Q4	Online learning helps in career growth	3.82	1.05	Agree
Q5	Online certifications are valued by employers	3.60	1.11	Agree

Q6	Online learning platforms are user-friendly	3.98	0.94	Agree
Q7	Online education saves time and cost	4.17	0.88	Agree
Q8	Online learning increases technical competencies	3.91	0.97	Agree
Q9	Interactive features improve learning engagement	3.83	1.03	Agree
Q10	Online learning motivates self-development	3.93	0.95	Agree
Q11	Online platforms help bridge the skills gap	3.96	0.92	Agree
Q12	I am satisfied with my online learning experience	3.92	0.96	Agree

Table 3 presents the mean and standard deviation values for the twelve questionnaire statements. The mean scores for all statements ranged between 3.60 and 4.17, indicating that respondents generally agreed with the positive role of online education in bridging the skills gap. The highest mean score was recorded for the statement that online education saves time and cost (Mean = 4.17), demonstrating that respondents consider flexibility and affordability as major advantages of online learning. Similarly, high mean values for accessibility and professional skill improvement indicate strong learner satisfaction with digital education platforms. The statement regarding employer recognition of online certifications recorded the lowest mean score (Mean = 3.60), suggesting moderate uncertainty about the acceptance of online credentials by employers. Standard deviation values ranged from 0.88 to 1.11, indicating a moderate level of variation in respondents' opinions. Lower standard deviation values reflect greater consistency among responses, whereas slightly higher values indicate differing perspectives among participants. The



statistical analysis demonstrates that respondents perceive online education as an effective and practical approach for skill development, career growth, and lifelong learning. The results further suggest that online education has significant potential to reduce the skills gap by improving accessibility to learning opportunities and supporting professional competency development.

Conclusion

The present study examined the changing landscape of online education and its role in bridging the skills gap among students and working professionals. The findings of the study indicate that online education has become an important medium for acquiring professional knowledge, technical competencies, and industry-relevant skills in the modern digital era. The analysis revealed that respondents generally hold positive perceptions toward online learning platforms due to their accessibility, flexibility, affordability, and convenience. Most participants agreed that online education helps improve professional skills, supports career growth, and encourages self-development. The study also found that online learning platforms provide updated knowledge and interactive learning opportunities that contribute significantly to skill enhancement. Furthermore, the widespread use of online platforms among educated and professionally active individuals demonstrates the growing acceptance of digital learning in India.

However, the study also identified certain concerns regarding the recognition and credibility of online certifications in the employment sector. Although respondents acknowledged the benefits of online education, some expressed uncertainty about employer acceptance of online credentials. This suggests that while online education has strong potential to reduce the skills gap, greater collaboration between educational platforms, industries, and policymakers is required to strengthen the value and recognition of digital certifications. Overall, the study concludes that online education is an effective and evolving tool for workforce development and lifelong learning. With improvements in digital infrastructure, platform quality, and institutional recognition, online education can play a transformative role in preparing individuals for the rapidly changing demands of the global labor market.



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