

**ONLINE EDUCATION IN THE INDIAN PHARMACEUTICAL INDUSTRY:
ASSESSING ITS ACCEPTANCE AND IMPACT ON EMPLOYERS DURING
HIRING AND PROMOTION DECISIONS**

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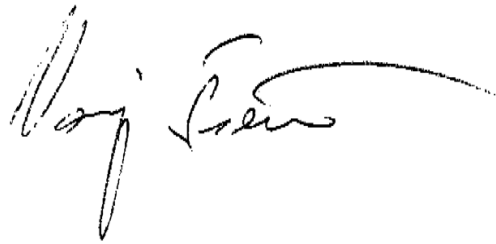
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Dedication

I dedicate this degree and dissertation to my loving family and Almighty. To my parents, friends, colleagues, and everyone. To my daughter, Yesha Bhardwaj, who has been my hope, guiding star and pillar of strength. To my parents, whose unconditional love, support and encouragement have been my strongest pillar of strength. Their belief in me has shaped who I am today. Their presence and belief in me shaped who I am today.

I love you all deeply and appreciate the unwavering support you gave me in this project and in every path, I have chosen to pursue in my life.

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ABSTRACT

ONLINE EDUCATION IN THE INDIAN PHARMACEUTICAL INDUSTRY: ASSESSING ITS ACCEPTANCE AND IMPACT ON EMPLOYERS DURING HIRING AND PROMOTION DECISIONS

Directed by: Dr.sc. Hrvoje Volarević

Pharmaceutical industry plays a crucial in advancing and developing new drugs, innovative treatments, digital technologies and medical facilities for the welfare of lives globally. The worldwide revenue of drugs market reached 1.48 trillion U.S. dollars in 2022 (Statista, 2023) and provided direct employment to over 5.5 million highly productive persons in 2017 (Ostwald, et al., 2020). India has emerged as a global leader in the pharmaceutical industry, with factors such as cost-effective manufacturing, a skilled workforce, digital advancements, and robust marketing and distribution systems. Indian government initiatives like Make in India, Digital India, and Production Link Initiatives (PLI) have strengthened India's drug industry ecosystem at global level.

Despite these advancements, the industry is facing skill shortages, particularly in digital technologies. NASSCOM (2022) reports a 21.1% demand-supply gap in Tech Talent, which is expected to increase to 1.4M-1.8M by 2026, specifically in areas such as AI/ML, cloud-based technology, and cybersecurity. The demand for skilled labors in healthcare, cyber security, digital technologies, data engineering, clinical, industrial and

economic research, and genomic and phenotypic analytics is more than the supply (ABPI, 2022; Diaz-Infante, Lazar, Ram, & Ray, 2022) leading to effective implementation of Pharma 4.0. These challenges are compounded by high attrition rates and difficulty in retaining skilled employees (Roy & Devi, 2016).

Online education presents a promising solution, offering flexible and tailored learning opportunities. This paradigm shift towards online education provides a viable solution to address the evolving demands of pharmaceutical industry along with a promising approach to address workforce challenges, and bridging skill gaps within this sector.

However, research analyzing the employer's perception of candidates with online diploma / degree / certification and their employability is limited to few geographies, specific fields, and industries. Study on employability of students with online education (Diploma / Degree / Certification) in pharmacy sector in India is either absent or rare. This highlights the importance of further research in this specific industry, highlighting potential opportunities and challenges unique to pharmaceutical education and employment.

This research aims to explore the perspective of employers of Pharmaceutical Industry in India towards their hiring and promotion decisions about candidates with online education / diploma /degree/ certification (graduate, post-graduate, and doctoral). This study tries to find out if the online education is being recognized and accepted by the pharmaceutical employers in India.

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CHAPTER I:

INTRODUCTION

1

The pharmaceutical industry significantly contributes to human development by improving quality of life, curing diseases and thus by saving countless lives. It contributes to economic growth by providing direct jobs in drug manufacturing as well as through job opportunities associated with its vast global supply chain (Ostwald, et al., 2020). India plays a major role in the global pharmaceutical industry and is referred as the ‘Pharmacy of the world’. At global level, India’s pharmaceutical industry ranks third largest in production volume and 14th largest in terms of market value (GOI, 2021). India is the world’s largest producer of generic medicine, accounts for ~60% of the total global vaccines production (IBEF, 2022) and supplies 20% of the world’s generic drugs (IBEF, 2023). During Covid-19 pandemic, Indian government administered 2.2 billion vaccination doses that became the world’s largest Covid-19 vaccination campaign and saved 3.4 million lives (GOI, 2023). It supplies affordable generic medicine not only to its own huge population (~1.4 billion) but to other developing countries.

However, with the impressive growth story of India’s pharmaceutical sector, the demand of skilled labor is also increasing. The persistent gap between industry needs and academic curricula has resulted in graduates who are unable to meet the sector's demands (FICCI; EY, 2021). Developing talent and retaining them remains the top priority of pharma companies as it eventually impacts their performance (Roy & Devi, 2016). Evolving industry needs due to shift towards Pharma 4.0 (termed by ISPE in 2017),

highlight digital transformation through technologies such as AI/ML, Big Data Analytics, Internet of Things (IoT), Robotic Process Automation (RPA), Cloud Computing, Additive Manufacturing and Cyber Security to increase productivity, compliance to regulatory affairs and stay competitive (Wolf et al., 2018).

Despite this impressive growth, Indian pharmaceutical industry is facing shortage of skilled professionals and future-ready talent across R&D life cycle in pharmaceuticals, life sciences and biotechnology fields (FICCI; EY, 2021). Demand for skilled labor extends beyond core fields such biology, medical, pharmacy, chemical engineering, mathematics and technology (Conicella, et al., 2015). As a result, the online education has emerged as a promising solution, offering flexible and tailored learning opportunities. This study analyzes if the online education is being recognized and accepted by the pharmaceutical employers in India, across organizations of all sizes and whether they operate in the Indian or global market. This study's findings will benefit undergraduate and postgraduate students, along with adult learners who are aiming for career progression through online education, academic institutions, and online education platforms.

1.1 Problem Statement

There are several studies, research articles, journals, and books highlighting the importance of online education worldwide. Post Covid-19, research has been conducted in countries such as US, UK, Saudi Arabia, India, Australia, Canada, UAE, and Africa, to determine the preparedness, acceptance, responses, satisfaction, assessment and effectiveness of online education for faculty, students, and institutions.

However, the study of the employer's perception of the students with online education and their employability is limited to a few geographies. Existing studies are confined to US (DeFleur & Adams, 2004; and Columbaro & Monaghan, 2008) in US, India (Naresh & Rajalakshmi, 2023), France (Chebl & Rayess, 2017); and Middle East (Alaa, 2016). Additionally, existing research is limited to specific professional fields such as accounts (Braun & Boldt, 2020), IT (Tabatabaei & Gardiner, 2012), MBA (Roberto & Johnson, 2019), nursing (Kinneer, 2013) and teaching (Adams & DeFleur, 2005; Flowers & Baltzer, 2006). However, research exploring the employability of students with online education (Diploma / Degrees / Certification) in pharmacy sector and specifically in Indian Pharmaceutical Industry is either not present or rare to find. This highlights the importance of further research in this specific industry, highlighting potential opportunities and challenges unique to pharmaceutical education and employment. This study aims to bridge the existing research gap related to this topic.

1.2 Research Question

What is the perception of Pharmaceutical Industry employers in India regarding online degrees (graduate, post-graduate, or doctoral) during hiring or promotion decisions?

1.2.1 Sub-questions

- Do the employers of Pharmaceutical Industry in India perceive on-line and on-campus education as equivalent during hiring?

- If employers hire candidates with online education, then at what stage they prefer to hire: fresh hiring or hiring for experienced professionals?
- What are the perceptions and attitudes of employers of Indian Pharmaceutical Industry about candidates who earned degrees on-line vs candidates who earned diploma / degree / certification through conventional on-campus during hiring/promotion decisions?
- Which segment in Pharmaceutical Industry in India: Small, Medium, Large or Start-ups is more receptive for online education?
- What are the factors contributing to the perceptions, attitudes, and policies of the employers for acceptability of online education?
- What measures could be implemented to increase the acceptability of online education by all stakeholders such as employers, institutions, policy makers and students?

1.3 Research Objectives

The purpose of this research is to explore the perspective of employers of India's Pharmaceutical Industry regarding their hiring and promotion decisions about candidates who obtained online education / diploma /degree / certification (graduate, post-graduate, and doctoral). The objectives of this research are:

1. To find out whether the employers of Pharmaceutical Industry in India perceive on-line and on-campus education as equivalent during hiring.

2. To find out If employers hire candidates with online diploma /degree / certification then at what stage do they show preference: fresh hiring and recruitment of experienced professionals.
3. To study how do employers of Indian Pharmaceutical Industry perceive degrees/certificates earned online compared to those earned traditional on-campus when making decisions regarding promotions.
4. To study which segment in Pharmaceutical Industry in India: Small, Medium, Large or Start-ups is more receptive for online degrees.
5. To study what knowledge, skills and qualities need to be provided to the graduates with online degrees to ensure their equal employability with graduates having degrees from traditional colleges.
6. To recommend measures for implementation that can boost the acceptability of online education in Pharmaceutical Industry in India.

CHAPTER II:

LITERATURE REVIEW

2

2.1 Introduction

The pharmaceutical industry plays crucial role in human development by research and development of drugs that curing disease, improve lives, and save countless lives. Pharmaceutical industry is of paramount importance in global welfare due to research and development of new drugs, innovative treatments, digital technologies and medical advancements. It contributes to economic growth by providing direct jobs and indirectly supporting other industries. Over the last two decades, the global pharmaceutical market expanded significantly with its revenues reaching \$1.48 trillion in 2022 (Statista, 2023). In 2017, Pharmaceutical industry directly employed more than 5.5 million highly skilled professionals (Ostwald, et al., 2020), while the US biopharmaceutical industry alone employed over 800,000 individuals who contributed \$22.9 billion in personal taxes (TEconomy Partners, LLC, 2019).

2.2 Background

India has emerged as a global leader in the pharmaceutical industry, with factors such as cost-effective manufacturing, a skilled workforce, digital advancements, and robust marketing and distribution systems. Government initiatives like Digital India, make in India, and Production Link Initiatives (PLI) have further strengthened India's position globally. However, the industry is facing skill shortages, particularly in digital

technologies. According to NASSCOM (2022), a 21.1% demand-supply gap in Tech Talent exists, expected to increase to 1.4M-1.8M by 2026 in areas such as AI/ML, cloud-based technology, and cybersecurity. High attrition rates and difficulty in employee retention further worsen the situation (Roy & Devi, 2016).

The pharmaceutical industry faces challenges due to rapid digital technology integration, skill shortages, and the limitations of traditional education systems. In response, online education presents a promising solution by offering flexible and tailored learning opportunities. Educational models, including Instructivism, Constructivism, and Connectivism, provide knowledge acquisition through online forums, digital libraries and internet sources, addressing diverse learning needs of individuals (Efferth, 2011; Rosendale, 2016). While all three models are relevant to e-learning, Constructivism is widely regarded as the most suitable by educational experts, as it aligns well with the evolving and interactive nature of online education (Efferth, 2011).

2.3 Growth of Pharmaceutical Industry in India

India holds a crucial position in the pharmaceutical industry at the global level and known as the ‘Pharmacy of the world’. India’s pharmaceutical industry ranks third largest globally in production volume and 14th largest in terms of market value (GOI, 2021). India has more than 3,000 drug companies and ~10,500 manufacturing units (IBEF, 2022). It provides the second-largest workforce to the global biotech and pharmaceutical industry (IBEF, 2023). Beyond employments in direct manufacturing of the drug products, the industry provides job opportunities through complex global supply

chain, providing 23 times more jobs in other allied sectors compared to those directly involved in the industry (Ostwald, et al., 2020).

With the remarkable growth in pharmaceutical production, the online pharmacy stores are also increasing with more than 50 start-up online pharmacy stores in India (Dcruz, et al., 2022). The online pharmacy market in India is growing at 63% CAGR, reaching US\$ 36 billion by 2022 up from US\$ 512 million in 2018 (Dcruz, et al., 2022). It supplies affordable generic medicine not only to its own huge population (~1.4 billion) but to other developing countries.

The Indian pharmaceutical industry valued at US\$ 50 billion, with exports over US\$ 25 billion is projected to grow at a CAGR of 22.4% by 2025 (IBEF, 2023). In 2021, domestic Indian pharmaceutical market was US\$ 42 billion and projected to expand to US\$ 65 billion by 2024 and US\$ 120 billion by 2030 (IBEF, 2022). India has the highest number of US-FDA compliant Pharma plants outside US with 262 facilities, 1400 WHO-GMP certified pharmaceutical plants, and 253 European Directorate of Quality Medicines (EDQM) approved plants, with latest state of the art Technology (GOI, 2017).

2.4 Problems faced by Pharmaceutical Industry in India

Rapid growth and adoption of digital technologies such as data analytics, automation, robotics, and artificial intelligence (AI) across drug discovery, clinical trials, manufacturing, packaging, inventory management and logistics has increased demands for skilled professionals (NASSCOM, 2022). According to NASSCOM (2022), India's technology workforce increased from 4.7 Mn in FY 2021 to 5.1 Mn in FY 2022 along with exponential increase in R&D expenses reaching US \$83 Bn in FY 2019 (U.S.

Government, 2021). Digital technologies are reshaping drug discovery, manufacturing, clinical trials, marketing, logistics and distribution by improving productivity, agility, increase compliance and reduce labor cost (Berger, 2016; EY, 2023). However, misalignment between the industry needs and academic curricula are resulting in graduates are not pharma industry-ready (FICCI; EY, 2021) making talent development and retention as top priorities of pharma companies impacting the organization's performance (Roy & Devi, 2016). They need to retrain and reskill their workforce in digital technologies, to develop expertise in e-pharmacy, long term patient care, virtual analytics, real-time data collection and enhanced responses (Accenture, 2018). Low skill jobs can be easily filled by unemployed youth, but the jobs that demand higher skills are difficult to be filled (Luseno & Obere, 2020). In India, industry diversification needs skilled pharma and digital experts to operate advanced instrument, develop product and process, IPR, Six Sigma, quality by design, understand global pharma regulations and align with the Pharma 4.0 requirements (Bhadoria, et al., 2010; Cini, 2022; Malviya, Malviya, & Dhere, 2023). Despite this gap, only 50.03% of the young Indians are considered highly employable, although demand for skilled talent rising in the BFSI, pharmaceutical, e-commerce, and IT/ITES sectors, with freshers hiring in these fields is expected to rise by 20% in 2023 compared to 2022 (Wheebox, 2023).

India's Higher Education Institutions (HEIs) have reached 52,000 by 2019 (GOI, 2021), becoming one of the largest in the world. The Gross Enrollment Ratio (GER) in higher education for the age group 18-23 years increased to 27.3 in 2020-21, reporting the highest growth in GER (GOI, 2021). Despite increase in HEIs, colleges and GER, there are challenges related to increasing population, quality of education, lack of

qualified faculty, insufficient funding and employability of graduates. According to ACEI Global (2020), within the next 5 years, the existing education system will struggle to accommodate the age group of 18-22 years due to population growth in this age group.

Indian students prioritize degrees over skills which results in a high number of graduates with low employability (ACEI Global, 2020). Limited academic-industry interaction results in gaps to the industry requirements and talent available (Berger, 2016; 2017; ACEI Global, 2020). Academic institutions encourage rote learning and getting degree than emphasizing on research initiatives and innovative thinking (FICCI; EY, 2021) resulting in a shortage of resources for medical research. For per million people, India has only 216.2 researchers, whereas China has 1,200, US has 4,300 and South Korea leads with 7,100 (Brookings India, 2019). In India, only 25 of 579 medical colleges and hospitals (4.3%) published over 100 papers a year accounting for more than 40% of the nation's total research output whereas 57.3% of these colleges failed to publish a single paper in a span of 10 years (2005–2014) (Ray, et al., 2016).

This study explores the perspective of different stakeholders of online education including Students, Educators or Faculty, Academic Institutions, Employers, and Policy Makers to provide a comprehensive analysis of its benefits and challenges. It also explores the measures currently being implemented or potential strategies to enhance the acceptance of online education equivalent to traditional learning. This literature review focuses on following topics:

1. Definition of Online Education
2. Reasons for rise in Online education
3. Students views on online education

4. Educators' views on online education
5. Academic gatekeeper's views on online education
6. Employers' views on Online education
7. Global Pharmaceutical Industry Outlook
8. Indian Pharmaceutical Industry Outlook
9. Policy Makers perspective
10. National Education Policy (NEP 2020) in India
11. Blended Learning

This literature review analyzes perspectives of various key stakeholders in online education, such as students, institutions, faculties, employers, and policymakers. It delves into both the advantages and drawbacks they perceive. It examines the current landscape of the Indian pharmaceutical industry, highlighting the challenges it faces in terms of talent and workforce. This study explores global online education and the employability of online degree holders across different geographic regions, and industries with a particular emphasis on India and its pharmaceutical sector.

2.5 Growth of Online Education Sector

At one end the demand for skilled labor is increasing, the market for online education is also increasing rapidly. The global online education market will reach US \$166.60 billion in 2023, and is estimated to grow at a CAGR of 9.48% between 2023-2027, reaching US \$239.30 billion by 2027 (Statista, 2023). The Indian Edtech sector is projected to grow into a \$30 billion industry over the next ten years (Cyrill & Bhardwaj, 2022). The United States, India, China, South Korea, and United Kingdom, will be the

top markets of e-learning (Bouchrika, 2023). As on March 31, 2019, India had 451 million monthly active Internet users, making it second largest country in internet usage (Cyrill & Bhardwaj, 2022). Online education platforms like Coursera offer specialized pharmaceuticals courses covering topics like drug discovery, commercialization, development, and intellectual property rights on (<https://www.coursera.org/>).

The history of online education traces back to 1920 when radio broadcasts were used for educational purposes (Clark, 2020). Over the years, the online education sector has evolved from supplementary to essential part of mainstream learning (Harasim, 2000) and offers various learning programs across industries, age groups and different target audiences. Online education refers to a type of distance learning where digital platforms are used to deliver majority (80% or more) of course content (Allen & Seaman, 2011; Kyalo & Hopkins, 2013). Success of online education depends on internet accessibility, government support, employer acceptance of online degrees, and the development of affordable, and industry-relevant courses (Jindal & Chahal, 2018). In US, online courses became more popular than face-to-face offerings with 66% of institutions observing increase in demand for newly introduced courses and programs, while 73% saw rise in enrollment for existing online courses and programs (Allen & Seaman, 2010).

2.6 Advantages of Online Education

Advancements in communication technology, digital platforms, and machine learning have revolutionized online education, making it accessible, flexible, and cost-effective (Sun & Chen, 2016). E-learning programs offer standardized content that can be easily updated and shared with large audiences simultaneously, fostering real-time

interaction and feedback from educators (Salter, et al., 2014). Massive Open Online Courses (MOOCs) have been instrumental in expanding online education, offering courses designed for unlimited participation and accessible via the web (Jindal & Chahal, 2018). MOOC courses can be customized as per learners' requirements and learning capabilities that has led to an increase in MOOC participation from 300,000 to 220 million from 2011 to 2021 learners globally (Goglio, Bertolini, & Parigi, 2023; Diaz-Infante, et al., 2022).

India, the second-largest e-learning market after the US, is projected to reach a market value of US\$1.96 billion by 2021 (KPMG, 2017; Cyrill & Bhardwaj, 2022). According to (Technavio, 2023), the Indian online education market is expected to rise at a CAGR of 19.9% between 2022 to 2027, reaching US \$3,461.93 million by 2027. Effectiveness of online learning depends on faculties' expertise, subject knowledge, content quality, learners' interaction, motivation, and efficient Learning Management Systems (Ibrahim, et al., 2021). Student self-efficacy and Motivation among students and teachers are important to enhance learning outcomes (Ragusa & Crampton, 2016; Ansar, Ali, Khattak, Naveed, & Zeb, 2020; Yusuf & Odutayo, 2023).

Online education caters to diverse needs, including employability, social learning, and entrepreneurship, attracting learners across various age groups (KPMG, 2017). Its utilization of technology and simulation enhances learning experiences through interactive tools and multimedia modules, including video, animation, sound, links to internet sources and several interactive tools (Hare, 2009) promoting confidence and problem-based learning (Dhir, Verma, Batta, & Mishra, 2017; Sagar, Mohite, Singh, Pawar, & Rao, 2023). It enables innovative thinking and develops research based skills

in students by integrating both visual and interactive tools (Sruthiya, 2022; Prakash, et al., 2023).

The 4th Industrial Revolution has transformed higher education by replacing conventional offline learning with blended and fully online classes (Choi, et al., 2021). Studies indicate that online is comparable to traditional methods in enhancing communication skills, facilitating knowledge acquisition, and aiding professional career development (Kaur, et al., 2020). Flexible and self-paced digital education empowers individuals to voice opinions, beyond age, sex, and racial discriminations (Harasim, 2000). During the Covid-19 pandemic, online courses grew rapidly, prompting teachers and lecturers to pivot to online classes and institutions ensured continuity by online updates, virtual classes, counseling sessions, and online job fairs (Panda, et al., 2021). However, online education is less effective in individual interactions, addressing specific learning needs, and balancing theoretical and practical information (Kaur, et al., 2020).

2.7 Inclusion Criteria

During this empirical research, various searches were conducted in several electronic databases such as Google Search Engine, Google Scholar, ResearchGate, ERIC, ProQuest, Taylor and Francis, PubMed, sci-hub.se and so on. Various terms were used to narrow down the search results such as history of online education, online education in Pharmaceutical Industry, perception of online education in Pharmaceutical Industry, Skill gaps in Pharmaceutical Industry, Employer's views on online degrees, their level of acceptance, their relevance in the Pharmaceutical Industry and so on. The

online literature mapping application, app.litmaps.co was utilized to generate related references and citations for additional insights.

2.8 Students Outlook

Online education is rapidly emerging as the top choice to in-person learning across most educational fields except Engineering (Allen & Seaman, 2008; Bejerano, 2008). Allen & Seaman (2008) reported a 12% increase in online course enrolment during the fall term of 2007, with over 3.9 million students participating. Students are opting for online programs as they are flexible, allowing students to balance full-time employment and personal commitments (Doggett & Lightner, 2010). For some students, online courses are the only available option who are unable or unwilling to go to regular face to face colleges (Ragusa & Crampton, 2016; Doggett & Lightner, 2010). Video content and live streaming for educational content kept students engaged, motivated, and physically active during this time (Williamson, et al., 2020).

Students' satisfaction of online education depends on the support offered by the academic institutions and platform (Markova, Glazkova, & Zaborova, 2017; Datta & Bhattacharya, 2022). Although Covid-19 adversely impacted the wellbeing of pharmacy students, their readiness for online learning and consistent interaction with faculty and administration helped the students to remain calm and decrease stress (Elbeshbeshy, Gim, & Quattrocchi, 2021; Attarabeen, Gresham-Dolby, & Broedel-Zaugg, 2021). Online learning is growing exponentially in medical fields, improving training outcomes for nurses through motion-capture simulations and online education (Efferth, 2011; Figueroa, et al., 2020). Efferth (2011) suggested online education facilitates lifelong

learning while protect healthcare professionals from infections. The Covid-19 pandemic accelerated online learning by implementing frequent assessments, interactive activities, and student engagement strategies (Markova, et al., 2017; Olum, et al., 2020).

2.8.1 Negative Outlook

Online education has seen remarkable growth, yet there are obstacles faced by students and faculty that impact its quality (Markova, et al., 2017). While online platforms offer knowledge in fields like medical education, they struggle to replace traditional methods, particularly for practices like dissections (Abualadas & Xu, 2023). Limited in-person interaction in online learning makes the students feel lonely and isolated, leading them to drop out from program (Bowers & Kumar, 2015).

Students in medical colleges faced poor connectivity, absence of human interaction and inadequate sound quality, long on-screen timing, time-zone related difficulties, and stressful environment, affecting their learning experiences (Gupta, Dabas, Swarnim, & Mishra, 2021; Elshami, et al., 2021). Students from lower socioeconomic backgrounds and rural areas encountered additional barriers such as lack of devices, need to share devices, poor network coverage, financial challenges, lack of knowledge about online portals, delayed feedback, and limited interaction with teachers and fellow students (Dumford, 2018; Atmojo & Nugroho, 2020; Quka, 2021; Datta & Bhattacharya, 2022). Although students gain knowledge from online education, they found face-to-face learning more efficient (Abualadas & Xu, 2023) and believe it cannot replace traditional education (Kaur, Dwivedi, Arora, & Gandhi, 2020; Panda, et al., 2021). Pharmaceutical students reported dissatisfaction with online learning due to

difficulty in understanding concepts, lack of motivation, technical and financial problems, assessment methods, limited interaction with teachers and peers, exam fairness (Ansar, et al., 2020). They reported limitation of online education to provide practical experience of compounding, dispensing, and demonstration of medication delivery (Morling, et al., 2022).

Students face multiple issues with online learning across countries adversely impacting skill development and learning outcomes. In Uganda, students reported lack of technical skills, costly internet and unreliable internet connections (Olum, et al., 2020). In US, students perceived online courses offering less critical thinking compared to traditional education (Kelly & Rebman, 2014). Pharmacy students in Indonesia felt that online learning is beneficial to acquire knowledge learning outcomes (LOs), but did not contribute to the development of attitude LOs and skills LOs (Syofyan, et al., 2020). Students in Egypt and Jordan felt that online learning increased their workload without enhancing professional skills and core competencies (Gamal & Aziz, 2011). Students at the Sports University of Tirana, Albania reported that online education are suitable for theoretical lessons, but it cannot replace practical session in sports education (Quka, 2021). In South Africa, students who were not well versed with English language avoided online platforms as they feared being misunderstood (Queiros & Villiers, 2016), while students at Peking University, China, expressed feeling isolated, lack of self-discipline and limited access to study materials (Bao, 2020). A study of 3897 STEM and non-STEM students in Hong Kong highlighted colleges' deficiencies in providing IT skills and entrepreneurship training (Mark, et al., 2018).

Hardware and software issues, internet connectivity, financial issues, security and safety of personal information, faculty and support staff shortage, technical support, lack of face-to-face interaction, psychological issues, language barriers, and online assessment further compound the challenges faced in online education (Dhir, et al., 2017; Datta & Bhattacharya, 2022).

2.8.2 Positive Outlook

Students choose online learning as it saves time by avoiding travels, provides flexible study hours, and allows to manage their personal schedule efficiently (Senhaji-Tomza, et al., 2023). For adult learners, online education presents an opportunity to complete their education and earn a Bachelor's degree (Hagan, 2013).

Research indicates no disparities in knowledge acquisition between online and face-to-face learning (Nesterowicz & Edelbring, 2015; Torda & Shulruf, 2021), and online learners are generally satisfied with their educational experience (Hagan, 2013). In medical education, students extensively use smartphones due to the convenience, accessibility, time-saving attributes, online workshops and easy online assessment (Gupta, et al., 2021; Ibrahim, et al., 2021). Online learning is suitable for students with greater diligence and independence (Choi, et al., 2021).

Research conducted with 23 medical students in US indicated that online learning tools such as multimedia resources, scheduling aids, communication platforms, and electronic health records enhance the learning experiences of medical students (Han, et al., 2014). Dental undergraduate students in India perceive online learning as beneficial and often use platforms like PubMed and Google Scholar for reference materials

(Prakash, et al., 2023). Online learning aids psychiatric students in decision making by helping in history taking, problem investigation, and exploring various clinical pathways (Hare, 2009). A study of 110 orthopaedic students in Chile found frequent use of webinars, online presentations, and patient consultations (Figueroa, et al., 2020). Studies suggest that pharmacists who graduated 15 years ago have more preference for online courses compared to current students (Alkoudmani, et al., 2021).

Pharmaceutical students find online learning effective due to its accessibility, time-saving, support in scientific research, understanding basic sciences and support for technological advancements in pharmaceutical education (Nesterowicz & Edelbring, 2015; Al-Alami, Adwan, & Alsous, 2022; Ravikumar, Morais, & Nagasubramanian, 2022; Elnour, et al., 2023; Naguib, AlSetohy, & Sabry, 2023). During COVID-19, pharmacy students experienced little disruption and felt online education was as effective as in-person education (Alrasheedy, et al., 2021; Elnour, et al., 2023).

Online learning fosters the development of professional skills and competencies such as self-study, effective planning, time management, problem-solving, and teamwork (Markova, et al., 2017). Several studies suggest that students feel online learning provides them more time to interact with other students, flexibility and discuss on study topics with teachers (Kyalo & Hopkins, 2013). Surveys in Ghana and Nigeria indicated high admiration and confidence in online education among students (Yusuf & Odutayo, 2023). A survey conducted on 174 fifth year medical students and 24 teachers revealed that students appreciate the problem-solving approach, interactive teaching methods, assessment systems, clinical teaching, online study materials, and technical support associated with online education (Sripadungkul, et al., 2023).

Nursing students in Uganda believe online education offers flexibility and aids address shortage of healthcare workers in remote areas (Sebuliba & Martha, 2022). Additionally, studies in the US revealed that online programs were perceived as equally or more rigorous than in-person programs and nursing students in online program about Patient Safety had better knowledge than who took courses offline (Doggett & Lightner, 2010; DePriest & Absher, 2013; Ortega, et al., 2020).

Effective online learning necessitates frequent communication among students and key stakeholders, allowing for integration of student feedback to enhance the quality of education (Choi, et al., 2021). Addressing student challenges, implementing suggestions, and ensuring proper resource utilization are vital for improvement in online education quality (Naguib, et al., 2023).

2.9 Educator's Outlook

Online learning has become integral in healthcare education, with digital platforms offering a variety of courses (Shawaqfeh, et al., 2020). In online learning, teachers carry greater responsibility to keep the students motivated, engaged and focused (Torda & Shulruf, 2021), and therefore requiring strong technical skills, foster constructive learning, encourage open discussions, and provide timely feedback (Queiros & Villiers, 2016). At Cagayan State University, Philippines, newer teachers showed greater acceptance of online learning compared to experienced ones (Bontogon, 2023). Sun & Chen (2016) stress that effective online learning relies on well-designed course content, active student-faculty interaction, trained teachers, nurturing online communities, and effective use of technology.

2.9.1 Negative Outlook

Digital technologies are playing a major role in higher education, providing new ways to close the gap between industry needs and academic learning. However, in India, a study of 874 participants including students, faculty, and parents revealed a preference for traditional learning over online education (Naik, et al., 2021). During the Covid-19, pharmaceutical faculties in Saudi Arabia faced challenges with the sudden shift to online teaching, citing lack of experience, technology unfamiliarity, and mental stress (Alqurshi, 2020; Chhetri, 2022).

Teachers reported lack of infrastructure and management support, limited internet connectivity, technical knowledge, unavailability of gadgets, negative attitudes of educators hindered the implementation of online learning (O'Doherty, et al., 2018; UNESCO, 2021; Dutt, Singh, & Garg, 2022). These challenges were compounded by lack of proper faculty training, absence of students, lack of interest and prolonged screen exposure (Safwan, et al., 2022).

Teachers faced difficulties in monitoring students' participation, evaluating assignments, and providing feedback in online education (Dutt, et al., 2022). Online teaching requires additional time in developing engaging content, delivering timely feedback, and interacting with students which significantly increased workload of faculties as online education required more time than in-person learning (Elshami, et al., 2021; Bontogon, 2023). Qualitative surveys of pharmaceutical faculty in Gulf countries highlighted lower effectiveness of learning outcomes in online education, as clinical training cannot be done online and requires students to be present in person and do the

procedure in front of the teachers and strong communication skills are essential for medical students in patient interactions (Atwa, et al., 2022)

2.9.2 Positive Outlook

Online learning provides teachers with opportunities to enhance their teaching skills by catering to diverse student preferences, including auditory, visual, and printed course materials (Reece & Lockee, 2019; Altwaijry, et al., 2021). Learning Management System (LMS) allows teachers to effectively monitor students' academic progress and performance (Leuenberger, et al., 2006). Many teachers perceive the quality of online learning to be comparable to face-to-face instruction (Safwan, et al., 2022). A study of nursing faculties from an US online university highlighted that personal interaction, timely feedback, knowledge gain, skills and active learning are important aspects for online educators (Frazer, et al., 2017). Encouraging problem-based learning, developing technical skills, updating knowledge and maintaining a positive attitude are crucial for effective online teaching (Karattuthodi, et al., 2021;). Educators emphasized that online assessment methods enhance students' overall skills by 70% and helped teachers to track student learning outcomes and provide customized learning experiences (Alqurshi, 2020).

2.10 Academic Gatekeeper's Outlook

Traditional classroom teaching alone cannot meet the growing demand of the industry; leading to expansion of online-learning in Pharmacy higher education, as a collaborative tool rather than a replacement for face-2-face (F2F) education (Lorenzoni,

et al., 2019; Hegerius, et al., 2020). Academic institutions are leveraging digital technologies to broaden access, provide lifelong learning opportunities, customizing industry specific courses, seeking government approval and align their programs with international regulatory bodies to expand their reach through online education (Wagner, et al., 2008). Amid the Covid-19 pandemic, schools and academic institutions transitioned to online learning, facilitated by EdTech companies (Williamson, Eynon, & Potter, 2020; Ibrahim, et al., 2021).

Day by day the online learning platforms are becoming an integral part of the education system (Sruthiya, 2022). In 2010, 89% of business colleges in US were offering at least one online course (Wright, 2014). Journalism programs, have also witnessed a shift toward online delivery, with 13% of programs already being offered online in the US and expected to grow further (Castañeda, 2011). Institutions supporting online learning has increased 25% since 2003, rising from 12.5% to 15.5% (Allen & Seaman, 2007). A survey of 2500 institutions in US reported that 65% included online education in their long-term plan, while 57% believed it as equivalent to or better than in-person learning (Allen & Seaman, 2011).

Bao (2020) citing Shang & Cao (2017) indicated that Chinese universities now offer over 500 courses through MOOCs, with more than three million enrolments. Microlearning, based on small units of learning, enables continual learning and relevance in rapidly evolving industries (Hegerius, et al., 2020). As more businesses and industries realize the benefits of online education, institutions are increasing the number of courses available online (Sagar, et al., 2023).

Allen & Seaman (2005) highlighted that in US enrolment in online education has grown at much faster rate than the overall enrolment rate in higher education. Later studies on higher education in US reported that online education is in higher demand than traditional education (Allen & Seaman, 2010). In U.S., Online distance learning (ODL) is widely used in higher education for healthcare and nursing students to enhance patient safety knowledge (Ortega, et al., 2020).

The ‘Victorian Comprehensive Cancer Centre (VCCC)’ in collaboration with the ‘University of Melbourne’ developed a fully online ‘Master of Cancer Science’ program that utilizes digital formats such as infographics, gamification and high-quality videos to meet the educational requirements of new generation of healthcare professionals (Lai-Kwon, et al., 2023).

The credibility of online degrees is closely related to the reputation of research universities, emphasizing the importance of educational quality (Hagan, 2013; Palvia, et al., 2018). Institutions can promote online learning by aligning curricula with market needs and adopting standardized platforms recognized by governments and universities (Diaz-Infante, et al., 2022). Furthermore, supporting students during transition to online learning, providing faculty and peer support, and designing student-centric course are crucial (Queiros & Villiers, 2016; Karattuthodi, et al., 2021; Alrasheedy, et al., 2021).

2.10.1 Negative Outlook

Many people and academic gatekeepers view online learning as an inferior option compared to traditional face-to-face education, especially for students who couldn't afford regular colleges (Knebel, 2001; Allen & Seaman, 2011). DeFleur &

Adams (2004) revealed that many deans and program directors were hesitant to enrol students with online bachelor's degrees, with acceptance limited to 7% in public and 11% in private institutions. Their major concerns included reputation and accreditation of the awarding institution, insufficient student-faculty interaction, and differing level of acceptance of online degrees across different fields of study (DeFleur & Adams, 2004).

Institutions show unwillingness to transition to online learning due to student discipline, faculty readiness, acceptance of online platforms, and increased effort required for effective online teaching (Allen & Seaman, 2007; Yeh & Tsai, 2022). Online learning faces challenges including poor technology infrastructure, insufficient technical support, budget constraints, and the necessity for faculty and staff training (Adeba, 2022; Bontogon, 2023). In low-income countries like Pakistan, limited infrastructure, unavailability of electricity and devices, high internet costs, lack of technical skills and training, and connectivity issues, create difficulties in implementation of online learning (Ansar, et al., 2020; Olum, et al., 2020; Farooq, Rathore, & Mansoor, 2020).

Online education is financially beneficial for institutions, but if not implemented correctly, it may pose challenges for students and faculty (Bowers & Kumar, 2015; Dutt, et al., 2022). High attrition rate, coupled with the indirect costs of online education, can outweigh the financial benefits (Kyalo & Hopkins, 2013; Wright, 2014). Also, the effectiveness of e-learning is highly dependent on access to mobile devices and affordable internet connections (Dutt, et al., 2022). Institutions not offering online learning view it as less effective than traditional education (Kelly & Rebman, 2014). Universities offering online courses face challenges related to establishing procedures, gaining trust, and ensuring recognition of online degrees in the labor market

(Tereseviciene, et al., 2020). Online education providers can address these challenges by providing reports, data, and qualitative evidence assuring successful recognition of online education (Tereseviciene, et al., 2020). However, laboratory experiments and hands-on experiences remain critical and can only be delivered effectively in face-to-face settings (Senhaji-Tomza, et al., 2023).

2.10.2 Positive Outlook

The demand for skilled business graduates has surged, prompting traditional colleges to offer online undergraduate degree programs (Wright, 2014). In medical education, learning extends beyond traditional classrooms to clinics, operating rooms, and simulation labs, where technology-enabled assessments enhance effectiveness (Han, et al., 2014). Recorded lectures and livestreams on internal university platforms benefit students (Al-Alami, et al., 2022).

Before the pandemic, few medical colleges in Pakistan conducted online classes due to limited IT infrastructure and lack of teacher training (Farooq, et al., 2020). Egypt has long faced overcrowded classrooms and high transportation costs in higher education institutions (Gamal & Aziz, 2011). Rising fuel costs and economic pressure will increase adoption for online education (Allen & Seaman, 2008). E-learning provides a cost-effective solution to growing enrolment rates in higher education, particularly in countries with limited university seats (Bejerano, 2008; Rowell, 2010; Gamal & Aziz, 2011).

Online education is widely utilized in pharmacy to enhance knowledge across various topics post-training (Salter, et al., 2014). Nursing faculties in the USA

acknowledge the lack of palliative care education, with difficulties in curriculum modifications (Mazanec, et al., 2019). Online education can address these gaps by distributing and integrating palliative care into nursing education (Mazanec, et al., 2019). Institutions like the ‘Institute of Pharmaceutical Technology (IPT)’, ‘University of Basel’ and the ‘Mendeleyev University of Chemical Technology of Russia (MUCTR)’ offer multimedia lectures for pharmaceutical technology students, compensating for the absence of equipment in their institutions (Leuenberger, et al., 2006).

2.11 Employer’s Outlook

A degree serves as tangible evidence that an individual has attained a specific level of knowledge and expertise (Vukelic & Pogarcic, 2011). However, the acceptance of online degrees in the professional realm remains a contentious issue. Employers’ express reluctance to hire individuals with online degrees due to challenges in evaluating the depth of knowledge these degrees represent (Vukelic & Pogarcic, 2011). Degrees obtained from for-profit institutions, are generally viewed less favourably (Cable, 2019; Winslow & Allen, 2020). Hiring decisions are influenced by the views and preferences of various stakeholders involved in the recruitment process (Watson, 2016).

Employers have a clear preference for graduates from traditional universities, with top public universities and private non-profit colleges being the most favoured, while online colleges are the least desirable option (Cable, 2019). This bias intensifies at senior positions in the organization, as 43% employers find them suitable for entry-level jobs compared to only 15% for executive roles (Udegbe, 2012; Mandelbaum, 2014; Grossman & Johnson, 2016). Accounting managers show more willingness to hire lower-

level employees with online accounting courses than those who have completed higher-level courses (Mauldin, et al., 2018).

Employers remain doubtful even if the online degrees are offered by reputable traditional institutions or follow a hybrid model (Sinow & Kyei-Blankson, 2012; Mandelbaum, 2014; Erden & Tekarslan, 2014). Studies indicate that institutional prestige and candidate's talent can be sometimes more influential than biases against online degrees (Linardopoulos, 2012; McDonald, 2014). Therefore, prospective students should prioritize the prestige and effectiveness of the institution offering online degrees, as these factors significantly influence employers' perceptions during the hiring and promotion processes (Kinneer, 2014). To enhance the acceptance of online degrees, academic institutions must focus on quality education and ensuring positive learning outcomes (Winslow & Allen, 2020).

A survey of 109 US university administrators indicated strong preference for faculty candidates with degrees from residential institutions (Adams & DeFleur, 2005). Similarly, US universities, colleges and high schools revealed that candidates with degrees from residential set-up were preferred over candidates with degrees earned fully or partially online (Adams J., 2016; Key, 2017). In Arab countries, online university degrees are not accepted for faculty positions despite the availability of online education since 2004 (Mustafa, 2013).

The reluctance extends in corporate hiring where online degrees do not hold similar value as traditional credentials (Adams & Defleur, 2006). Employers survey in US revealed that only 4% employers were willing to accept candidates with online

degrees in 2006 and only 7% employers perceived online courses from accredited institutions as equivalent to courses offered by traditional colleges (Adams, et al., 2007).

Employers raise concerns with online education about the clarity of instruction, credibility, trustworthiness, limited personal interaction, and missing accreditation (Karl & Peluchette, 2013). Employers' fears also include regulation of institutions, authenticity of course content, chances of academic dishonesty, and the belief that students who did not attend college studies will lack commitment in work (Columbaro & Monaghan, 2008; Mustafa, 2013; Sadik, 2016). Additionally, employers often displayed doubts whether core subjects such as STEM courses and accounting can be effectively taught online (Jonathan, 2009; Preston, 2014; Jonathan, 2016)

Employer's perception about online degrees is largely shaped by the context in which they are presented as a degree earned online from a reputable traditional institution carries more prestige than one from a purely online institution (Adams & Defleur, 2006; DePriest & Absher, 2013).

However, employers' perceptions of online degrees are evolving and gradually shifting towards accepting online credentials (Kaupins, et al., 2014). Online programs have potential to address shortages of qualified personnel in industries facing skill gaps (Engel, 2016). Acceptance of online degrees varies across different industries and geographic regions. In US, a survey of HR managers revealed that industries requiring high levels of expertise and training are more skeptical towards online credentials (Thompson, 2009). Employers in rural areas are more cautious about hiring candidates with online degrees than those in urban and suburban areas (Richardson, et al., 2011). Despite these challenges, some studies suggest that employers generally do not

differentiate between online and traditional degrees during promotions (Roberto & Johnson, 2019). This indicates a potential shift towards more equitable treatment of online credentials in certain contexts.

2.11.1 Negative Outlook

"Hireability," or the likelihood of someone being hired (Slagle, et al., 2021), depends on various factors, including the mode of education an individual receives. Despite the increase in online, bias against online education persists (Carnevale, 2007). In the health sector, academic institutions advise undergraduate students to not opt for online education (Lorenzoni, et al., 2019). This bias stems from the perception among college administrators that only 12% of employers find graduates truly prepared for industrial demands (Faingold, 2019; Saunders & Zuzel, 2010), placing online degrees holders at an economic disadvantage relative to those with traditional credentials (Roberto & Johnson, 2019).

Employers often express reservations about the efficacy of online courses in fostering crucial skills through peer and instructor interaction (Jonathan, 2009). A study involving 202 hiring managers revealed a strong preference for traditional degree holders over graduates of MOOCs (Rosendale, 2016). Notably, employers who lack experience with online courses showed stronger reservations towards them (Carnevale, 2007).

Despite the historical use of distance education in delivering health and medical training since the 1960s (Knebel, 2001), employers hesitate to hire individuals with online degrees (Chaney, 2002). Most employers do not consider the ability to manage online courses as an important criterion for evaluating candidates' performance,

preferring applicants with traditional degrees (Adams & DeFleur, 2005). Similar biases persist at various academic levels, driven by lack of social interaction and institutional infrastructure (Flowers & Baltzer, 2006; Bolton, 2010; Preston, 2014; Eakins, 2019).

While online doctoral programs are producing more graduates, the number of available academic positions has not increased accordingly (Slagle, et al., 2021). Bolton (2010) found that only 20% of employers prefer candidates with online degrees, while 28% consider online degrees equivalent to traditional ones. Employers cited concerns about unaccredited institutions issuing degrees primarily for financial gain, the authenticity of degrees, and societal pressure to adhere to conventional cultural norms (Vukelic & Pogarcic, 2011; Engel, 2016).

Employers prioritize factors such as accreditation, reputation of institutions, personal interaction, teamwork, and the ability to apply real-world scenarios during hiring (Preston, 2014; Jonathan, 2016). Online MBAs are viewed as more beneficial for individuals switching companies than for those remaining within their current organizations (Roberto & Johnson, 2019).

In accounting, hiring managers at Big 4 firms in the US were reluctant to employ graduates from online for-profit organizations, citing concerns about rigor, interpersonal skills, and academic integrity (Faingold, 2019). Big Four and medium-sized accounting firms establish partnerships with reputed local universities and recruit from them, none of which currently offer online accounting degrees (Burkhart, 2017).

Employers in Austria are reluctant to hire candidates with online degrees due to concerns about the authenticity of degrees printed at home and the lack of recognition for online institutions (Vukelic & Pogarcic, 2011). In US, HR managers perceive online

courses and degrees as requiring less effort and of inferior quality, particularly for school principal positions (Richardson, et al., 2011). In Tanzania, most employers prefer candidates from traditional colleges as they have doubts about the practical skills imparted through online education, influenced by their own educational background from traditional colleges (Kisanga, 2020). Employers hiring online graduates are suggested to stay updated about latest technologies and industrial trends to attract top talent and collaborate with institutions in grooming future leaders (Jaleh Dehpahlavan, 2013).

2.11.2 Positive Outlook

Online education has become a reliable substitute for traditional learning with the increasing number of institutions offering online programs (Tabatabaei & Gardiner, 2012). Isaac (2019) cited work done by Ayo, Odukoya, & Azeta's work in 2014 that suggests employers should prioritize the overall skill sets of employees over the degree source. Some employers are now willing to accept candidates with online degrees from reputable institutions (Naresh & Rajalakshmi, 2023) and this acceptance is more when hiring managers have personal experience with online learning (DeFleur & Adams, 2004; Sinow & Kyei-Blankson, 2012; Fogle & Devonda, 2013; Kaupins, et al., 2014; Gross, 2022). Technology based companies are more inclined towards hiring online degrees holders over traditional industries (Roberto & Johnson, 2019).

Studies from the US indicate that candidates with online degrees exhibit traits such as perseverance, discipline, and strong time management (Gordon, 2013). In Nigeria, employers view graduates from distance learning programs favourably, emphasizing that online learning effectively replicates the key features of on-campus

opportunities (Falode, et al., 2021). Continuous training is essential for organizations, and online education is offering interactive learning and customized programs to meet market demands (Palvia, et al., 2018; Diaz-Infante, et al., 2022). Academic hiring gatekeepers view online education as a solution for faculty shortages and offer employment opportunities in higher education (Engel, 2016).

During hiring decisions, employers value qualities such as integrity, self-motivation, teamwork, critical thinking, business knowledge, enthusiasm, technical expertise, and emotional intelligence, in candidates (Saunders & Zuzel, 2010; Conicella, et al., 2015; Carada, et al., 2022; Naresh & Rajalakshmi, 2023). The credibility of online degrees relies on educational quality, adherence to education standards, and developing awareness (Bahir, 2014). Employers are increasingly prioritizing an individual's academic performance, skills, integrity and experience over the mode of obtaining the degree (Tabatabaei & Gardiner, 2012; Chebl & Rayess, 2017). Employers no longer distinguish between online degrees and traditional degrees and majority of employers consider online degrees equivalent to traditional colleges (Bahir, 2014; Kaupins, et al., 2014; MCKILLOP, 2018).

Employers' decisions regarding candidate selection are primarily influenced by work experience, followed by a combination of education and work experience or job requirements (Peat & Helland, 2004). Employers tend to accept online graduate degrees more readily than online undergraduate degrees (Peat & Helland, 2004). About 69% HR professionals in Texas, US, and 90% employers in Canada do not discriminate between online and traditional degrees when making promotion decisions (Bahir, 2014; Kaupins, et al., 2014).

Studies conducted in India and Australia, highlight the positive impact of online education on employability. A survey conducted on 37 ‘Bachelors of Information Technology’ students from ‘IGNOU’, India indicated majority of students said online courses in IT helped them to secure jobs (Gaba, 2005). Additionally, employer found that nurses with online degrees demonstrated better technical skills than nurses with traditional degrees (Gross, 2022). Remote and Isolated work experience during COVID-19 has been identified as beneficial for professional growth (Gill, 2020). Employers perceive online business management students having superior skills in time management, internet usage, and digital capabilities (Bertran, et al., 2014).

Hiring managers across various industries in Nigeria revealed a strong acceptance of candidates with online degrees, indicating the growing recognition of online education's (Isaac, 2019). Small firms inclined to hire online degree candidates due to their digital skills, multitasking abilities, and problem-solving skills that align well with the culture of small businesses (Burkhart, 2017). Employers also emphasize integrating synchronous online components in educational programs (Beauvais, et al., 2019). They recommend sensitizing hiring managers to identify reputable online institutions and effectively utilize skills of online graduates (Adams, et al., 2007).

Online degree holders can overcome negative perception of employers by building a strong network, gaining practical experience, showcasing digital skills and adding relevant signals in their resumes to boost job prospects (MCKILLOP, 2018; Sagar, et al., 2023). Participating in extracurricular activities can address concerns about social interaction (Watson, 2016).

2.12 Global Pharmaceutical Industry Outlook

The innovative pharmaceutical industry aims medical advancements and transforms research into novel treatments accessible to patients (EPFIA, 2022). It employs 840,000 individuals in Europe, generates three times more indirect employment, making it one of the top industries in the region (EPFIA, 2022). Its growth is fuelled by increased productivity, where the value added for every job is five times higher than the economy's average (BAK Economics, 2022).

Due to direct impact of drugs produced by pharmaceutical industry, it operates under strict regulations and compliance (Arief, et al., 2022). Digitalization has revolutionized pharmaceutical operations, streamlined processes, facilitated virtual labs and enabled faster decision-making through real-time data access (Rinker, Khare, Padhye, & Fayman, 2021; Sugandha, Ranjan, Gupta, & Gupta, 2023). Due to COVID-19, adoption of digital technologies rapidly increased resulting in cost savings and enhanced efficiency (Sugandha, et al., 2023).

Today there is acute shortage of highly qualified STEM professionals with information communication technology ICT offering potential to enhance STEM education (Adeba, 2022). Low-income countries struggle with a shortage of digitally skilled professionals due to inadequate technological infrastructure and innovative technologies (Adeba, 2022), MNCs in China, face a workforce skills deficit, while North American and European engineering graduates have exposure to teamwork and real-world problem-solving (Farrell & Grant, 2005). Medical education which relies heavily on soft skills faces challenges in adopting e-learning methodologies (Gupta, et al., 2021).

HR managers across various departments are struggling to meet growing demand for digital talent prompting more aggressive hiring practices (Capgemini Consulting, 2015; Liu, et al., 2021). In Japan, pharmaceutical companies encounter challenges in developing digital programs due to varying individual skill levels (Liu, et al., 2021). While experts recommend that students must receive real-world training for 6-12 months prior to their graduation, insufficient resources and funding in pharmaceutical companies restrict student participation in training programs (Balakrishnan, et al., 2020). However, stereotypes persist regarding online degree programs, with employees perceiving differences in learning effectiveness compared to traditional programs and expressing uncertainty about disclosing online degrees (Kizilcec, et al., 2019).

Online education presents employers and healthcare practitioners flexible, affordable, accessible learning without the need for extensive travel, while maintaining personal and work life balance (Hare, 2009; O'Doherty, et al., 2018; Lorenzoni, et al., 2019). An analysis of online literature supports the efficacy of online learning in enhancing medical student knowledge and skills, and advocates integration of additional online medical courses to address these challenges (Pei & Wu, 2019). Continual learning is crucial in the pharmaceutical sector to stay updated on drug research advancements, regulations, and new technologies. Continuing pharmacy education, often delivered through e-learning, is mandatory in many countries to maintain professional licenses (Nesterowicz, et al., 2014).

2.13 India's Pharmaceutical Industry Outlook

India's modern pharmaceutical industry began to take shape in the early 20th century, with the establishment of Bengal Chemical and Pharmaceutical Works Ltd. in Kolkata in 1901 and Alembic Chemical Works Co. Ltd. in Vadodara in 1907, both still operational (Akhtar, 2013). Initially, India relied on imported medicines for the first two decades post-independence (Jain & Jatar, 2022). Over time with rise in outsourcing, availability of skilled talent, and the sector's growth created excellent job prospects for research and skilled employees (Sachan, Sachan, & Gangwar, 2012). The Indian pharmaceutical industry ranks among the top five industries generating foreign exchange revenues (Jain & Jatar, 2022). Government's 'PLI' schemes have facilitated industry growth, investments and increased job opportunities (GOI, 2023). With 1.72% contribution to GDP, pharmaceutical industry plays a vital role in the nation's economic growth (GOI, 2023). Additionally, India is establishing Digital centres of Excellence (CoEs) to nurture digital talent (NASSCOM, 2020). Also, with 'National Digital Health Mission (NDHM)', government aims to build an electronic health record (EHR) by integrating telemedicine, EMR, and unique health IDs, requiring extensive education, training, and skilled professionals (EY, 2022).

The comprehensive details of pharmacy education in India are not available (Basak & Sathyanarayana, 2010). Currently in India, there are no academic institution offering courses for Pharmaceutical Manufacturing despite 2.5 million needing skilled professionals by 2022 (Bhargava, 2022). Pharmaceutical students often lack skills to meet changing industry demands (Balakrishnan, et al., 2018). In India, 38.4% of pharmaceutical industry experts attribute students' low performance to technical skills

gaps (Balakrishnan, et al., 2020). These gaps are evident in lab expertise, proficiency with advanced instruments, subject-level knowledge, quality, regulatory understanding, pharmacokinetics, drug metabolism, and insufficient industry exposure across all levels (Parikh, 2014). Indian companies also struggle as most graduates from premier institutes prefer working in specific metro cities (Sadik & Brown, 2019).

Modernizing pharmacy education is essential for fostering critical analysis and innovative thinking skills (Jishnu, et al., 2011). Introducing new age courses such as pharmacogenomics, pharmacokinetics, pharmacodynamics, and medical informatics can improve the job prospects (Mangasuli, et al., 2008). Institutions must incorporate industrial training, internships, and workshops for student skill development (Balakrishnan, et al., 2018; Jishnu, Gilhotra, & Mishra, 2011).

COVID-19 emphasized integration of digitalization into pharmacy practice and education, requiring educators proficient in digital teaching (Silva, et al., 2022). E-learning in medical education in India is growing significantly facilitated by the accessibility of computers, smartphones, and affordable internet (Dhir, et al., 2017).

Digital technologies helped Indian pharmaceutical companies establish strong brand images, reach global market, increase revenue, and produce cost-effective drugs (Venkataswamy, et al., 2016). Positive ROI of digital technologies in Indian pharmaceutical industry aligns with international findings (Blaga, et al., 2021). In India and China, demand for scientists, regulatory specialists, AI/ML experts, cloud developers, blockchain experts, data architects and leaders is rising in pharmaceutical sector (Garavan, 2012; McKinsey & Company, 2012; NASSCOM, 2020; Arief, et al., 2022; Shashi, 2022). Policymakers should incorporate the creation of MOOCs into

national strategic plans and promote academic research focusing on online education (Zhang, et al., 2020).

2.14 Policy Maker outlook

The Indian government spending on online learning has increased steadily since 2005 and anticipated to grow further, particularly in Tier-II cities and rural areas under Digital India program (Bhadoria, et al., 2010). Indian Government adopted distance learning early and started ICT-enabled programs such as Computer Literacy and Social on Schools (CLASS), SWAYAM, IGNOU, ‘Consortium for Educational Communication, (CEC)’, School of Open Learning (SOL), Online Education Broadcast; and Virtual Classrooms (Jaggarwal & Sushila, 2022). However, effective implementation needs dedicated efforts from government, institutions, faculty, students and employers to nurture trust and credibility for online education (Abedalla, et al., 2014).

Indian pharmacy education offers several programs, such as Diploma in Pharmacy (DPharm), Bachelor of Pharmacy (BPharm), Master of Pharmacy (MPharm), Master of Technology in Pharmacy (MTech (Pharm), and Doctor of Pharmacy (PharmD) (Sachan, et al., 2012). Success of pharmacy education relies on assessing learning outcomes and improving accreditation standards and integrating online interactive courses and innovative computer simulations (Elnour, et al., 2023). Life-long learning and integrating digital tools for skill enhancement is strongly recommended by regulatory body ‘Medical Council of India’ (Dhir, et al., 2017).

Globally, countries are developing long-term education policies integrating the growing role of online education (Zancajo, et al., 2022). Presently, 70 institutions across

20 countries in Asia provide distance learning programs (Bandalaria, 2018). In Sri Lanka and Ethiopia, governments are investing in online education to address limited university places for higher education to increase enrolments (Adams, Liyanagunawardena, & Williams, 2014; Ministry of Education, 2018).

In the Asia-Pacific region, Singapore, Hong Kong, Taiwan, and China prioritize e-Learning to enhance education quality by adopting best practices, creating digital classrooms, and developing digital skills among students, along with providing digital resources and e-books (Kong, et al., 2014).

In Europe, online education is gaining traction, prompting policymakers to devise plans to popularize online modalities in higher education (Curaj, et al., 2015). Several programs are launched at both national and European Union (EU) levels to promote e-learning and MOOCs (Arneberg, et al., 2007; Curaj, et al., 2015). EU permits credit transfer from accredited universities, adhering to the framework of the European Credit Transfer and Accumulation System (Asian Development Bank, 2021) and funding “eLearning – Designing Tomorrow’s Education” and the “European Social Fund” to allocate funds for top-notch e-learning programs (Dimauro, et al., 2008).

In UK, the government is encouraging online education as an effective means to cost-cutting by requiring institutions to expand their online degree offerings and provide report on graduate employability (McDonald, 2014). In UK, multiple software tools and learning applications are utilized to teach Pharmacology that aids during lectures and help students in learning at their own pace with ease (Hughes, 2002). France is enhancing vocational education by prioritizing high-demand professions like personal

services, sustainable development, and digital transformation, with a focus on improving teachers' digital and pedagogical skills (OECD, 2020).

Italy's universities are embracing online Learning Management System (LMS) tools for their educational initiatives (Dimauro, et al., 2008). However, Central and Eastern European governments, including Hungary, Slovakia, and Slovenia, face hurdles due to language barriers, limited digital infrastructure, economic constraints, and lack of digital training (Arneberg, et al., 2007).

In US, the Institute for Higher Education Policy (IHEP) in 2000 established benchmarks to ensure quality for Distance Learning in areas such as: Institutional support, course development, student and teacher support, and assessment (Byers, et al., 2002). The US Department of Education is working to enhance e-learning quality by redefining the assessment process of students (Rowell, 2010).

Online education serves as a stabilizing force within globally interconnected ecosystems, enabling people from developing countries to acquire talent and skills, ultimately bridging the employability gap with those in developed countries (Black, et al., 2019). In Asia, India, Indonesia, and Malaysia have emerged as pioneers in accrediting online courses from other universities and online platforms like Coursera, edX, and FutureLearn (Asian Development Bank, 2021).

Government and institutional administrators should arrange interactive workshops on online teaching methods for higher institutions lecturers to promote a positive outlook towards online education and regularly monitor them to ensure continuous improvement (Karattuthodi, et al., 2021; Yusuf & Odutayo, 2023). As employers are key stakeholders, they should be consulted when creating new online

curricula to gain expert advice (Linardopoulos, 2012; Jaleh Dehpahlavan, 2013). The wider use of mobile technologies and gamification is making online education more accessible (UK India Business Council, 2015). Assertiveness and discipline are essential for effectively implementing online learning (Dewi & Barid, 2021).

2.15 National Education Policy (NEP) 2020 India

A forward-looking national education policy plays a strategic role in developing future-ready human capital by nurturing critical thinking, innovation, and economic growth (Malik & Venkatraman, 2017). India's New Education Policy 2020 (NEP 2020) aims to overhaul the education system to meet the demands of 21st-century by strengthening academic, cognitive, analytical, and socio-economic development (GOI, 2020). NEP 2020 emphasizes on leveraging online education to ensure quality education by developing digital infrastructure, online platforms, establishing virtual labs, and promoting blended learning (Sheergugri & Raj, 2022). The University Grants Commission (UGC) mandates that 40% of higher education course be delivered online (Ravikumar, et al., 2022), and introduced the National Credit Framework (NCrF) to promote lifelong learning (GOI, 2023). Additionally, NEP 2020 encourages Open Distance Learning (ODL) in HEIs ensuring equivalent standards between online and on-campus degrees/diplomas (GOI, 2020). Recently, UGC has implemented two significant changes regarding PhD programs: 1) Eliminating the requirement for mandatory publication of research paper(s) before thesis submission, 2) Allowing undergraduate students who have completed a four-year-degree to enroll in PhD programs without completing master's degree (Gohain, 2022; GOI, 2022).

2.16 Blended Learning

Blended Learning refers to courses where 30 to 79% content is taught online, while the rest is taught through traditional classroom sessions (Allen & Seaman, 2005). This involves integrating multiple delivery modes such as printed study materials, instructor-led training, and online modules (Čonková, 2013; Reece & Lockee, 2019). Internet is popular to deliver education as it is affordable, accessible and offers interactive course content (Čonková, 2013). For medical and pharmacy students, a multi-modal approach combining online and traditional learning is more advantageous to teach anatomy and histology (Olum, et al., 2020; Al-Alami, et al., 2022; Abualadas & Xu, 2023).

Online learning complements teachers by utilizing interactive technologies rather replacing them (Hughes, 2002). Open or blended learning is preferred than solely relying on fully online methods to avoid public criticism and to gain employer acceptance (Alaa, 2016).

At global level, employers also favoured hybrid learning over fully online methods: US hiring managers across industries preferred hybrid learning over fully online methods (Fogle & Devonda, 2013), whereas in Chile, 57% of employers showed inclination towards candidates educated in a hybrid model (Bobeka, et al., 2022). A focused and methodical efforts can foster positive perceptions of online learning (Naik, et al., 2021).

2.17 A Comparative Study of Online Education from Different Geographies

A total of 300 documents were reviewed and analysed as part of literature review. The continent wise breakup of studies is presented in Table 1. The maximum number of studies and reports were from Asia 39% (117 out of 300), followed by North America 32% (99 out of 300), then Europe 11% (33 out of 300), Africa 5% (16 out of 300), Australia 3% (8 out of 300), South America 2% (7 out of 300). Around 6% (19 out of 300) studies and reports were at global level in different countries, and 1-1 studies were conducted in North America and Europe, Africa and North America, and Asia and Africa combined. Details are given in Table 1: Continent-wise Published Literature and Figure 1 below:

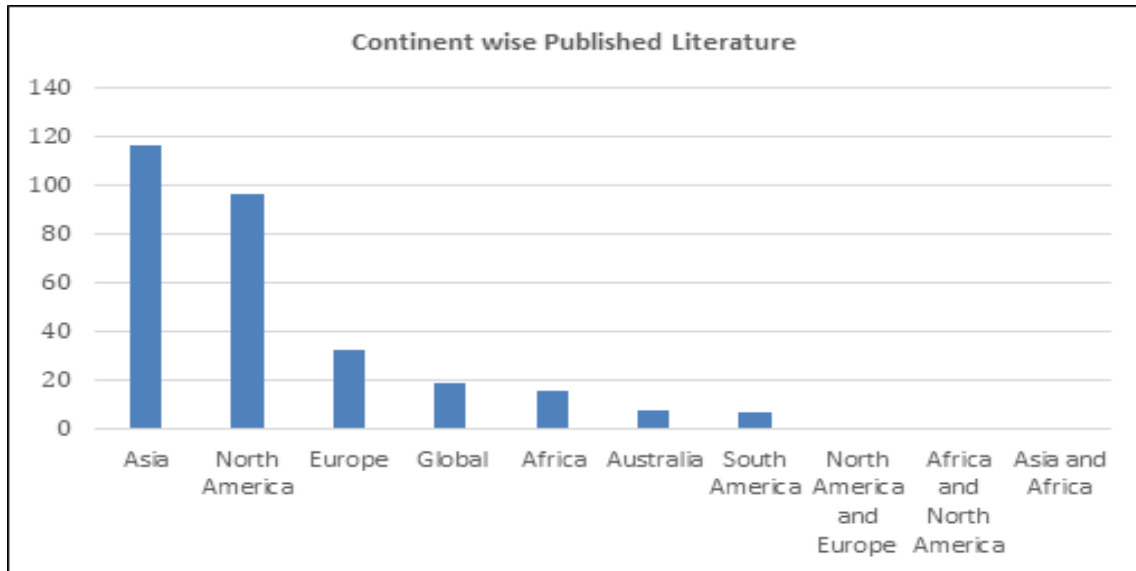
Table 1: Continent-wise Published Literature on Online Education

Continent	Number of Published Literature
Asia	117
North America	97
Europe	33
Global	19
Africa	16
Australia	8
South America	7
North America and Europe	1
Africa and North America	1
Asia and Africa	1
Total	300

Source: Author's work.

Given below is the graphic representation of continent wise published literature on online education.

Figure 1: Continent wise published literature on Online Education



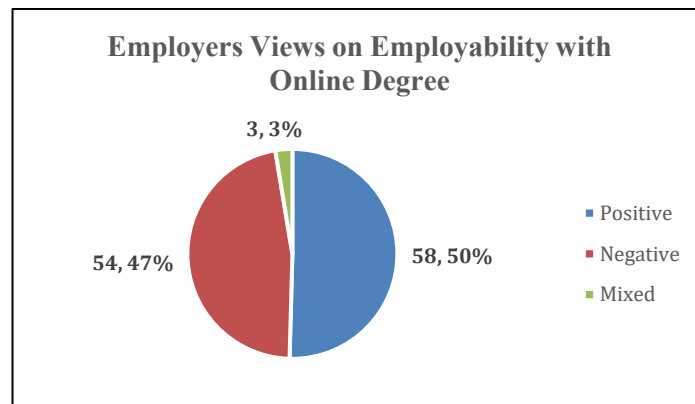
Source: Author's work.

2.18 Published Literature on Employability with Online Degree

This literature review on the employability of individuals with online degrees analyzes 115 published works out of 300 total published literature, covering research papers, reports, articles from newspapers, and reputable online platforms. The findings reveal a positive trend in the acceptability of online degrees, with approximately 50% (58 out of 115) of employers or hiring gatekeepers displaying a favorable attitude towards candidates possessing online qualifications. However, despite this positive trend, a significant portion of employers, constituting 47% (54 out of 115), remain hesitant to hire individuals with online degrees. Moreover, approximately 3% (3 out of 115) of the

surveyed employers expressed mixed opinions regarding the acceptance of online degrees. This subset includes employers who are open to hire candidates with online degrees from reputable institutions, have prior work experience, or demonstrate exceptional skills relevant to the job role. While the acceptability of online degrees among employers is increasing, a large number of employers still have reservations. This necessitates for further research and efforts to increase the recognition and acceptance of online qualifications among industry. Details are given in Figure 2 below:

Figure 2: Employers Views on Employability with Online Degree



Source: Author's work.

2.19 Country wise Employers Acceptability of Online Degrees

Total 115 published literature were referenced for exclusively on employability of individuals with online degrees for this literature review including research papers, reports, articles from newspapers, and reputable online platforms. The majority of these studies, constituting 52% (60 out of 115), were conducted in the US, indicating a significant emphasis on this topic within the US. Following the US, 10% (12 out of 115) of the research studies are from India, highlighting the need for studies on employability

of individuals with online degrees in India. A smaller proportion of studies, 5% each, were conducted at a global level and within the UK, comprising 6 out of 115 and 5 out of 115 studies, respectively. This suggests a limited focus on the employability of candidates with online degrees in a broader international context and specifically within the UK. The global contribution in research on this area is limited, highlighting a major gap in the existing literature regarding the employability prospects of individuals who have pursued or are considering online education. This highlights the need for more research to bridge the gap to understand various perspectives related to effects of online education on employability in different regions and cultures. Details are given in Table 2 below:

Table 2: Country-wise View on Employability with Online degrees

Country	Positive	Negative	Mixed	Total
US	18	40	2	60
India	8	3	1	12
Global	6			6
UK	4	1		5
Brazil	2	2		4
Arab world	2	1		3
Nigeria	2	1		3
Poland	2			2
Australia	1			1
Austria		1		1
Bangladesh	1			1
Canada	1			1
Chile	1			1
Germany	1			1

Country	Positive	Negative	Mixed	Total
Ghana		1		1
Indonesia	1			1
Italy	1			1
Pakistan	1			1
Philippines		1		1
Portugal	1			1
Russia and Switzerland	1			1
Singapore		1		1
Slovakia	1			1
Spain	1			1
Tanzania		1		1
Turkey		1		1
Uganda and US	1			1
US and Europe	1			1
Total				115

Source: Author's work.

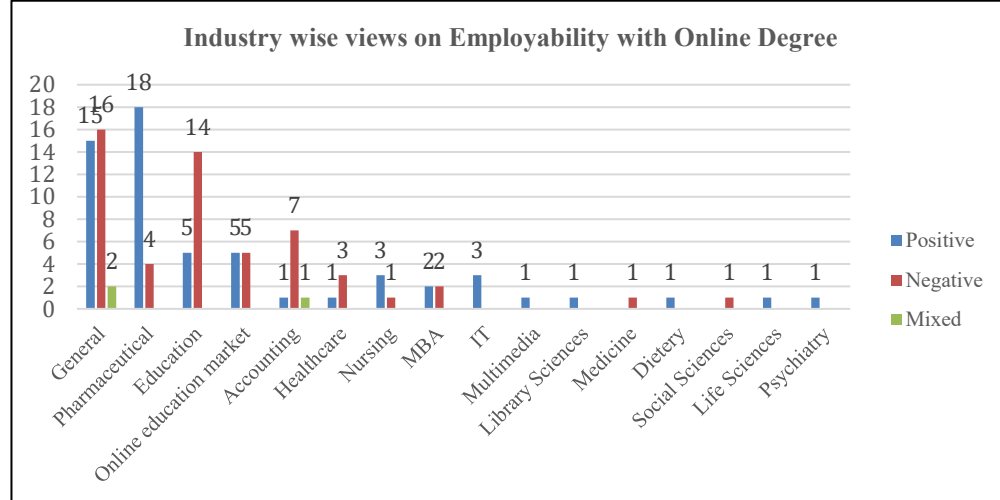
2.20 Industry-wise Views of Employability with Online Degrees

Total 115 published literature were referenced for exclusively on employability of individuals with online degrees for this literature review including research papers, reports, articles from newspapers, and reputable online platforms. The distribution of these studies across various industries and sectors helps to get key trends of research in this field. The largest number of studies comprising 29% (33 out of 115), are from across different industries worldwide. Next is the pharmaceutical industry with 19% (22 out of 115) of the referenced studies exploring employability within this sector.

Additionally, the perspective of employers from general education institutions accounted for 17% (19 out of 115) of the studies and 9% (10 out of 115) of the studies presented viewpoint of employers specifically associated with online education institutions, shedding light on the acceptance and recognition of online degrees in educational institutions.

However, only a minimal number of studies were conducted within specific sectors such as accounting, healthcare, MBA, IT, and medicine, suggesting a gap in research in these areas. This highlights the need for further investigation into the employability outcomes of individuals with online education across diverse industries and sectors globally. Details are given in Figure 3 below:

Figure 3: Industry-wise views on Employability with Online Degrees



Source: Author's work.

2.21 Country wise Published Literature on Online Education

The literature review referenced a comprehensive array of 300 published works sourced from various countries worldwide. This collection encompasses diverse forms of literature, including research papers, governmental policy documents, reports, newspaper articles, articles from renowned websites, conference proceedings, books and more. Notably, the largest proportion of referenced studies originates from the United States, constituting 31% (94 out of 300), followed by India with 22% (66 out of 300). Additionally, 6% (19 out of 300) of the literature stems from Canada, while 3% (eight out of 300) are attributed to Saudi Arabia and Australia, respectively. Combined studies were conducted in specific countries including Taiwan, Singapore, Hong Kong, and China, as well as Russia and Switzerland, and Pakistan and Egypt. Furthermore, a single study is attributed to the European Union.

Most studies are related to the growth, benefits and disadvantages of online learning. But, the study on acceptability of online degrees by the employers is limited to few industries such as accounting, MBA, Nursing, Teaching and very few in pharmaceutical industry. In Indian context, empirical study on willingness of employers of pharmaceutical industry to hire candidates with online degree is negligible, underscoring a need to explore the scope of employment for candidates planning to pursue their education whether graduate, postgraduate or doctoral. Details are given in Table 3 below:

Table 3: Country-wise Published Literature on Online Education

Country	# Of Published Literature
United States	94
India	66
Canada	19
Saudi Arabia	8
Australia	8
United Kingdom	6
Indonesia	5
Pakistan	5
Arab world	4
Brazil	4
Philippines	4
China	5
Nigeria	4
European Union	3
Poland	3
Germany	2
Kenya	2
Austria	2
Ghana	2
Canada	2
Egypt	2
Portugal	2
Chile	2
Russia	3
Italy	2
Turkey	2
Jordan	2
Ethiopia	2

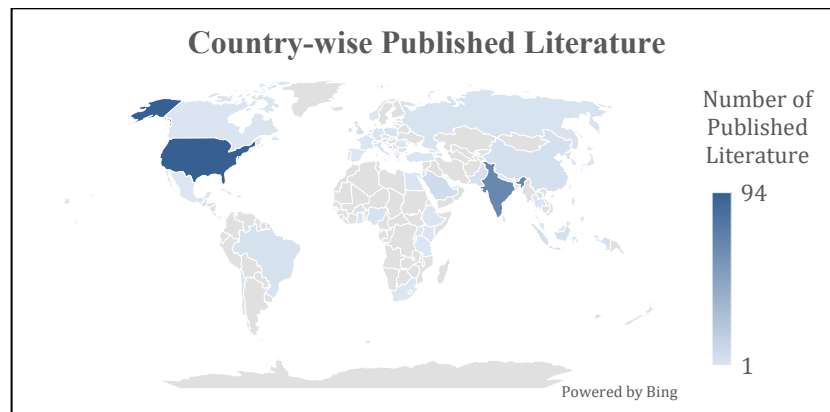
Country	# Of Published Literature
Fiji	1
South Africa	1
Sharjah	1
Lebanon	1
Switzerland	1
Lithuania	1
Japan	1
Albania	1
United States	1
Spain	1
Nepal	1
Tanzania	1
Bangladesh	1
Uganda	2
Norway	1
Serbia	1
Gulf	1
Singapore	1
Slovakia	1
Hong Kong	1
South Korea	1
Canada	1
Sri Lanka	1
France	1
Taiwan	1
Qatar	1
Thailand	1
Romania	1
United Arab Emirates	1

Country	# Of Published Literature
Europe	1
Asia	1
Malaysia	1
Africa	1
Mexico	1
Total	300

Source: Author's work.

Given below in Figure 4 is the geographical mapping of literature referenced from various countries.

Figure 4: Published literature on Online learning from Various Countries



Source: Author's work.

2.22 Industry wise Published Literature

The literature reviewed in this research on online education spans various industries. Among the 300 documents referenced, the pharmaceutical industry contributes the largest share at 32% (97 out of 300), followed by general Education at

23% (70 out of 300). Additionally, 16% (49 out of 300) of the studies and reports are generic, covering multiple industries. More than 8% (25 out of 300) studies and articles are from Online Education industry. Medicine contributes 7% (20 out of 300), while Accounting makes up 4% (11 out of 300). Furthermore, literature from fields such as MBA, multimedia, sports sciences, and others were also referenced. Details are given in Table 4 below:

Table 4: Industry-wise Published Literature on Online Education

Industry	Number of Published Literature
Pharmaceutical	97
Education	70
General	49
Online education market	25
Medicine	20
Accounting	11
Nursing	6
Healthcare	4
MBA	4
IT	3
Multimedia	1
Social Sciences	1
Psychiatry	1
Hospitality	1
Biomedical	1
Dietary	1
Psychology	1
Journalism	1
Sports	1

Industry	Number of Published Literature
Library Sciences	1
Life Sciences	1
Total	300

Source: Author's work.

Although numerous research papers have been published on pharmaceutical sector in India, most of these studies are on outdated academic curricula, growing online education in pharmaceutical and medical fields, widening gap between Industrial needs and academic institutions, high demand of digital technologies, and the acute shortage of skilled and experienced professionals across various departments of pharmaceutical industry such as R&D, clinical trials, manufacturing, logistics, sales, packaging, distribution, and marketing. There is significant lack of research on how the online education can help address the talent shortage in this sector. Also, there is scarcity of research on what is the employers' perspective about candidates who completed their graduate, post-graduate or doctoral degrees online. The study on acceptability of online education by the employers of Indian pharmaceutical companies are extremely rare.

2.23 Industry wise Published Literature in India

Total 66 published literature documents were reviewed from India. Among these, the majority, constituting 55% (36 out of 66), focused on the pharmaceutical industry, with 12% (8 out of 66) dedicated to both the online education market and the general education sector. Industry wise published literature in India is given in Table 5:

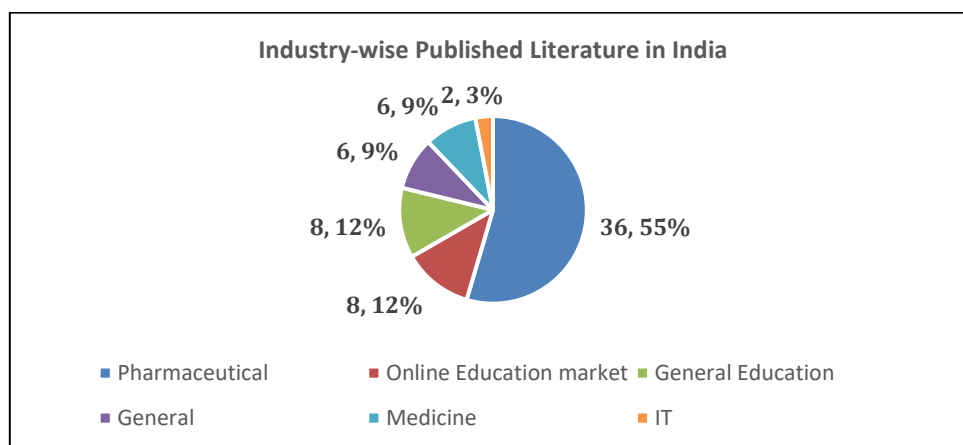
Table 5: Author's Work: Industry-wise Published Literature in India

Industry	# Of Published Literature
Pharmaceutical	36
Online Education market	8
General Education	8
General	6
Medicine	6
IT	2
Total	66

Source: Author's work.

The graphical representation of industry-wise data on Online Education in India is given below in Figure 5 below:

Figure 5: Industry-wise Published Literature on Online Education in India



Source: Author's work.

These studies focus of the growth of online education in pharmaceutical education during and post Covid-19, outdated syllabus of pharma education in India, need to update the curricula, talent required due to Pharma 4.0, Academic-Industrial

collaboration and robust policy reforms for all stakeholders. However, despite of steady increase in the online education in India in all sectors including pharma, there is a lack of research on employers' acceptance online degrees across industries and sectors. This gap is more evident in pharmaceutical industry, where the research on acceptance of online degrees by hiring gatekeepers is scarce.

2.24 Theoretical Framework for the study

Advancements in technology has transformed distance education stressing the clear definition to support institutional policy, purpose and administration (Simonson, 1999). Simonson's Equivalency Theory (1999), states that the distant learners and traditional learners should have equivalent learning experiences. Here, equivalent does not mean 'same; rather focuses on equal values of learning experiences in terms of Comparable Outcomes irrespective of the delivery method of education (Simonson, 1999).

Simonson (1999) asserts that course work of distance education should designed to compensate for the differences in learners' environment such as accessibility to infrastructure, interaction with faculty and peers, real-time experience with campus resources. An in-person laboratory experiment could be replaced by an interactive simulation or remote lab, achieving the same learning outcome through a different medium. Simonson (1999) introduced Equivalency theory comprising following five interrelated factors, demonstrating the potential of strategically implemented online learning:

1. **Equivalency:** states different learning modes can be equally effective when learning experience is designed to achieve the same comparable instructional outcomes.
2. **Learning experiences:** include all the resources, exercises and interactions that promote learning such as recorded lectures, group discussions, problem solving activities, building decision making capabilities, etc.
3. **Appropriate application:** includes delivering course materials according to the technological capability, resources and presence of the learner.
4. **Students:** includes all enrolled learners irrespective of the location. It treats all the students equally as part of same learning community and ensures all students get the same academic rigor and opportunities for achievement.
5. **Outcomes:** Ensures that students in traditional colleges and distance learning develop comparable learning outcomes and apply the knowledge in real life work exposure.

Bernard et al. (2004) reported that comparing classroom education and distance learning having equivalent instructional design indicated no significant difference in both learning outcomes. Means et al. (2010) found that blended and online learning outcomes were equal or better than traditional learning when learning strategies were aligned with students' requirements. These findings establish that the quality and appropriateness of learning experience for students is more important than the mode of delivery of education.

Equivalency Theory provides strong justification for the perception of online degrees by pharmaceutical employers in India during hiring and promotion decisions by

asserting if online education is designed ensuring effective use of technology, relevant course content, and interactive session it can provide comparable learning outcomes for online graduates as those graduates from traditional colleges.

2.25 Research Hypothesis

H01: There is no significant difference in Indian pharmaceutical employers' willingness to accept online degrees during hiring and promotion decisions across different level of equivalency perception of online degrees with regular degrees.

H11: There is significant difference in Indian pharmaceutical employers' willingness to accept online degrees during hiring and promotion decisions across different level of equivalency perception of online degrees with regular degrees.

H02: The accreditation status of program, reputation of the institution and industry relevance does not significantly impact the decision of employers.

H12: Indian Pharmaceutical employers are more inclined to accept online degrees when the programs are accredited, from reputed institutions and industry specific.

H03: There is no significant difference in the perception of pharmaceutical employers towards online degrees while hiring or promotion decisions for across departments such as core departments (e.g. R&D, Manufacturing, Clinical Trials, and Audit), support departments (e.g. HR, Admin, Finance), both core and support and not fit for any department.

H13: There is a significant difference in the perception of pharmaceutical employers towards online degrees while hiring or promotion decisions for across departments such

as core departments (e.g. R&D, Manufacturing, Clinical Trials, and Audit), support departments (e.g. HR, Admin, Finance), both core and support and not fit for any department.

2.26 Discussion

This literature review demonstrates wide-spread global studies on the growth and importance of online education. Especially after Covid-19, extensive studies are conducted in countries such as US, UK, Saudi Arabia, India, Australia, Canada, UAE, and Africa, to determine the preparedness, acceptance, responses, satisfaction, assessment and effectiveness of online education for faculty, students, and institutions.

However, the research on employer's views on employability of online degree holders is limited to very few geographies and industries. The study on employability of candidates with online education (Diploma / Degree / Certification) in pharmacy sector in India is either not present or rare to find. This highlights the importance of further research in pharmaceutical industry, highlighting potential opportunities and challenges unique to this sector. This study is an effort to close the existing research gap on this subject.

CHAPTER III: RESEARCH METHODOLOGY

3

3.1 Research Methodology

The purpose of this research is to explore how employers in the Indian pharmaceutical industry perceive online diploma /degree / certification (graduate, post-graduate, and doctoral) whether they are completed partially or fully, during hiring or promotion. This study will also analyze if there is any relation between skills and employability of the candidates with online credentials. Employers' perspective and any bias/s that may impact hiring (for fresher or experienced individuals) or promotion decisions will also be investigated. By identifying the root causes underlying these perceptions, the study aims to find appropriate solutions to address employers' concerns effectively.

This chapter consists of the following sections: research approach & strategy, study population and sampling, data collection methods & instruments, data analysis methods, research study period, trustworthiness and ethical considerations.

3.2 Research Approach & Strategy

A qualitative approach is an interpretative and naturalistic approach that focuses on understanding how people perceive and give meaning to phenomena such as their actions, decisions, beliefs, values, and other aspects within the context of their social world (Snape & Spencer, 2003). On the other hand, a Survey is a descriptive research

method that collects information from people to describe, compare, or interpret their emotions, thoughts, knowledge, beliefs, and actions (Fink, 2016).

In this study, Mixed Methods Methodology approach was employed to address the research questions. By integrating qualitative and quantitative techniques, this approach ensured a comprehensive analysis including both generalization and specific insights (Tashakkori & Teddlie, 1998). As this study focuses on labor economics and urban education, employing mixed-method approach was suitable to explore both generality and particularity of employers' perspective about online education. The online surveys provided generality of the findings whereas in-depth semi-structured interviews with small group of pharmaceutical employers provided deeper insights.

3.3 Study Population and Sampling

The target population was the employers of Indian pharmaceutical industry who hire candidates with graduate, post-graduate or doctorate degrees across organizations of all sizes including startups, small and medium enterprises, large companies, spanning public, private and social sectors. A fair and scientifically selected sample increases accuracy of representation of population parameters (Mweshi & Sakyi, 2020). As there are approx. 3000 pharmaceutical companies in India (GOI, 2023; IBEF, February 2023), a sample size of 341 was calculated with confidence level of 95%, a maximum variance of 50%, and a margin error of 5% (Taherdoost, 2017).

Participants were selected using convenience sampling as well as through referrals by snowball sampling. The survey responses and interview recordings were

documented and shared with the respondents. At the conclusion of survey and interviews, an abductive approach was applied for analysis and draw insights.

3.4 Data Collection Methods and Instruments

This study used surveys, documentation and in-depth / unstructured interviews as primary data collection methods. The questionnaire included combination of targeted, open-ended, and flexible questions, along with Likert-scale questions allowing participants to choose between different answers such as strongly disagree, disagree, agree, strongly agree, and unsure (DePriest & Absher, 2013). The survey approach was inspired by previous research conducted by Adams and DeFleur (2004, 2005, 2006, 2007, 2009), Bahir (2014), Thompson (2009); Čonková (2013), and Sinow-Mandelbaum (2014). The target sample group comprised HR professionals, including managers, specialists, consultants, and other experts as they have substantial knowledge of organizational policies related to hiring and promotion (Kaupins, et al., 2014).

The research documentation included but not limited to interview questions, survey forms, organizational profiles obtained from their websites, and other relevant materials. This comprehensive approach enabled participants to provide well developed responses and allow researchers to address relevant issues raised spontaneously during the study.

An online survey was conducted to get general reactions of large number of employers and qualitative semi-structured interviews will be conducted to get focused views of selected employers. For quantitative analysis, the online survey was conducted to understand the employers' perceptions and acceptability of online degrees. Personal

interviews were conducted with a small group of participants for qualitative analysis. The clarifying questions will be designed based on the findings from the quantitative phase. The survey responses will provide deeper insights about the employers' perceptions regarding their willingness to hire candidates with online degrees (Sebuliba & Martha, 2022). Interviews were conducted over telephone or video conference and recorded with participants' consent to uphold the reliability and validity of the research.

Testing of survey and interview

The survey design and interview design were tested by conducting mock-survey with two volunteers and mock-interview with one volunteer who were selected randomly from Online Networks. The objective behind testing survey and interview was to eliminate the risk of misinterpretation of the question(s) by participants and to estimate the time duration for survey and interviews. The data collected from the mock surveys and interviews were discarded and not included in the research data set.

3.5 Research Study Duration

The research study was initiated in India on 01-May-2025 and data gathering continued until 15-Aug-2025. The participants were recruited by from online communities, social networks, personal and professional circles, company websites, NASSCOM Directory, and Google.

Survey

The survey was created using Google Forms and made live on 10-May-2025 and was closed on 15-Aug-2025. Total 487 participants took the survey and 352 completed responses were received. The qualifying question at the start of the survey automatically exited the survey who did not meet the qualifying criteria. One response per email address was enabled to avoid the multiple responses from same email.

The survey form was distributed through instant messaging app to my personal and professional contacts and sending messages, email to the LinkedIn profiles from Pharmaceutical Industry. Average time to fill the survey was 06 mins.

Interviews

A total of 33 interviews were conducted between 01-Jun-2025 and 15-Aug-2025. The interview participants were recruited through LinkedIn contacts and my personal and professional network through snowball method and convenience selection.

Before starting the interview, the purpose of study, anonymity, and privacy protection was explained to participants and followed by asking permission to record the interview for academic research purposes. The interviews were conducted via audio conferencing and ranged between 30 - 40 mins. Audio was recorded using firelies.ai chrome extension and auto-transcriptions of the interview were generated using tactiq.io chrome extension. The participants were also invited to receive the outcome of the research study once it is completed. Six participants showed interest in the research outcome.

3.6 Data Analysis Methods

Data collected through surveys were transferred to Microsoft Excel for screening, extraction and exploratory analysis (Abualadas & Xu, 2023). Interview recordings and audio transcriptions were analyzed manually and then imported to Microsoft Excel for further analysis. Both quantitative and qualitative data were analyzed to identify keyword frequencies, recurring phrases and common words which were utilized to create categories and recognize recurrent themes. Qualitative data analysis is a structured process of examining and interpreting non-numerical data to derive useful information and generate new knowledge. The thematic analysis based on abductive approach was performed using Mural software to identify, categorize, analyze and interpret patterns/themes within the data. This approach helps to derive conclusions and provide valuable insights (Bahir, 2014).

3.7 Ethical considerations

The researcher will secure an authorization letter from the university stating that the data collected will be used exclusively for academic purposes. In order to maintain ethical integrity, the participation in this study will be entirely voluntary, and respondents can withdraw participation at any time. There will not be any incentive for participation and no penalty for discontinuation. The anonymity of survey respondents and confidentiality of interview respondents will be protected at all times.

3.8 Threats to Validity

The potential threats to validity of this research include multiple attempts, misinterpretation of questions, and potential researcher bias.

Multiple attempts

Although the survey was designed to restrict responses to one per Email ID to minimize the possibility of multiple responses from same person, this may not have fully prevented submission of multiple responses if participants used multiple Email Ids.

Misinterpretation of questions

The participants may have misunderstood questions, influencing their responses impacting the study's result. Although the survey questions were tested with two volunteers and interview questions with one, the risk may still have present.

Researcher's bias

My recent online education, contrasted with my undergraduate face-to-face studies, that could have influenced the phrasing of the research survey and interview questions. I consciously avoided sharing my personal experiences, maintained neutrality, and re-examined my research analysis and interpretations to reduce personal bias.

3.9 Limitation

This research study had two prime limitations: first, all interviews were conducted over audio conferencing instead of in-person interviews which might not have built rapport with participants. Second, convenience sample method was used for this study which may not be the representative of true population size. The findings, as a result, are not generalizable.

3.10 Delimitation

This research study was delimited in two ways: First, the survey was kept short to engage respondents and minimize dropping out. Second, descriptive analysis was used instead of statistical analysis to conclude the result of the survey. These delimitations influenced the research study's scope.

3.11 Summary

This research study used quantitative online survey and qualitative semi-structured interviews with Indian Pharmaceutical employers to find their views on online degrees during hiring and promotion decisions. Participants included managers, employees, Senior Managers, Directors and Executives from various departments of pharmaceutical companies in Private, public and government organizations. Data was collected over a duration of three months from 15-May-2025 to 15-Aug-2025 from 33 interviews and 352 survey responses. This data was then analyzed thematically and descriptively.

CHAPTER IV:

RESULTS

4

4.1 Research Findings I – Interviews, Survey, and Hypothesis

4.1.1 Research Interviews

A total of 33 semi-structured interviews were conducted via video conferencing, each lasting 25-35 minutes. These sessions successfully captured participants' views on online degrees during hiring and promotion. Each interview started with five qualifying questions, followed by two hypothetical scenarios on hiring and promotion, and detailed semi-structured questions. Interviews also included demographic questions for the effective classification of participants. An open-ended question at last was included that allowed participants to share their additional thought, perspectives, suggestions and views.

Participant Demographics

Participant Gender and Age

Among the 33 participants, 91% (30) were males and 9% (3) were females. A majority of participants 45% (15) were from age group between 41-50 years, comprising 93.0% (14) males and 7.0% (1) female. Participants in 31-40 age group were 39% comprising 33% (11) males and 6% (2) females. Participants in age-group 51-60 were 12% (4) and all were males. Participants in the age group 21 to 30 years comprised 3%

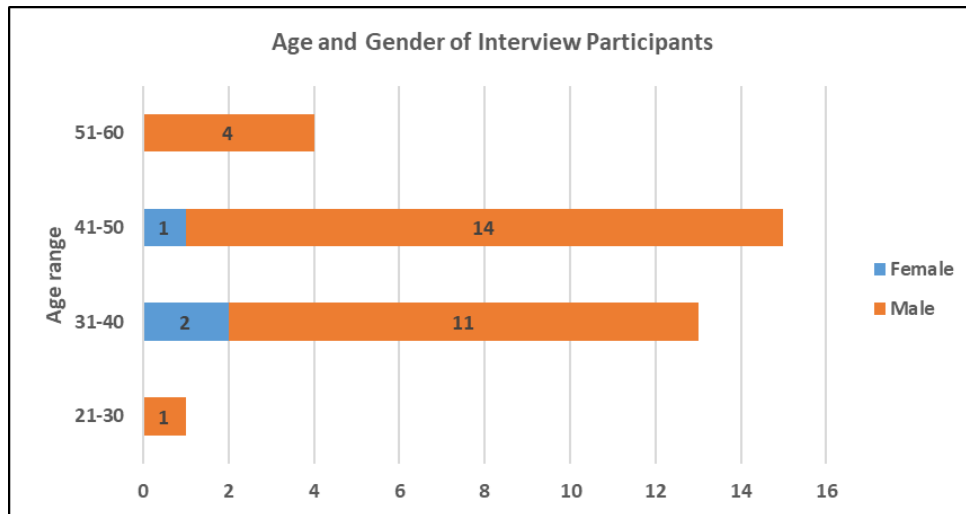
(1), having only one male. The detail breakdowns of age and gender of participants are given in Table 6 and Figure 6.

Table 6: Age and Gender of Interview Participants

Age	Female	Male	Total
21-30		1	1
31-40	2	11	13
41-50	1	14	15
51-60		4	4
Total	3	30	33

Source: Author's work.

Figure 7: Age and Gender of Interview Participants



Source: Author's work.

Highest Education and Mode of Education

Among the 33 participants, 76% (25) had professional degrees, comprising 48% (16) from regular institutes, 15% (5) from blended and 12% (4) from online mode.

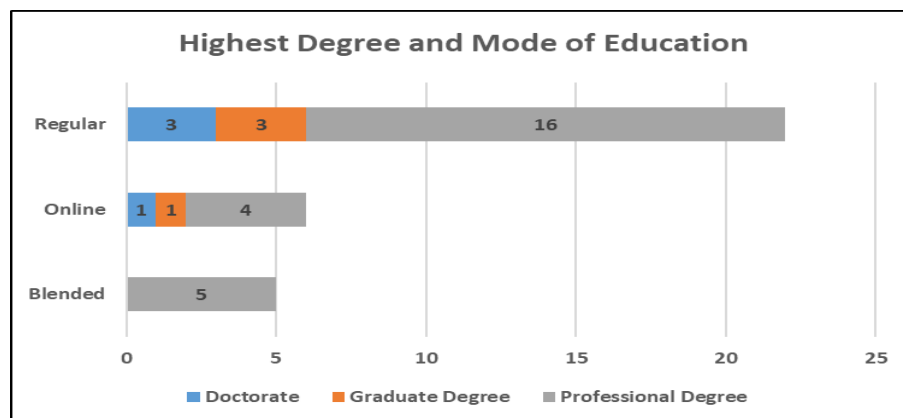
Participants having doctorate degree were 12% (4), comprising 9% (3) from regular institutes and 3% (1) from online mode. Participants having graduate degree were 12% (4), comprising 9% (3) from regular institutes and 3% (1) from online mode. The detail breakdowns of Type of degree and mode of education of participants are given in Table 6 and Figure 8 below:

Table 6: Type of Degree and Mode of Education

Type of Degree	Mode of Education			
	Blended	Online	Regular	Total
Doctorate		1	3	4
Graduate Degree		1	3	4
Professional Degree	5	4	16	25
Total	5	6	22	33

Source: Author's work.

Figure 8: Type of Degree and Mode of Education



Source: Author's work.

Sector vs Size of Participants Organization

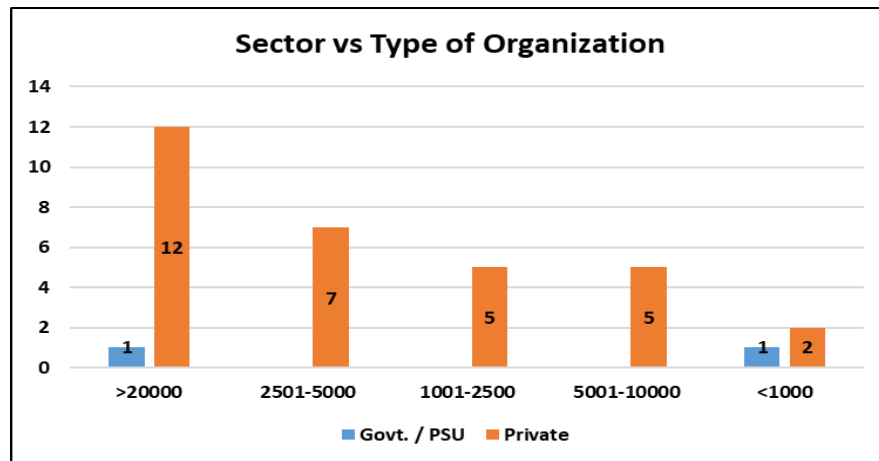
Out of 33 participants, the majority of participants 94% (31) were employed in the private sector and only 6% (2) were working in the government sector. Regarding organizational size, maximum number of people 39% (13) were working in large organization with more than 20,000 employees, 21% (7) were employed in 2501-5001 in small to medium size organizations. About 15% (5) worked in small sized 1001 - 2500 and small to medium sized 5001-10000 organizations. A small number of participants 9% (3) worked in small organization having <1000 employees. Table 7 and Figure 8 below provide sector and organization size analysis.

Table 7: Sector vs Size of the organization

	Govt. / PSU		Private		Total	
Number of employees	Count	%	Count	%	Count	%
>20000	1	3%	12	36%	13	39%
2501-5000			7	21%	7	21%
1001-2500			5	15%	5	15%
5001-10000			5	15%	5	15%
<1000	1	3%	2	6%	3	9%
Total	2	6%	31	94%	33	

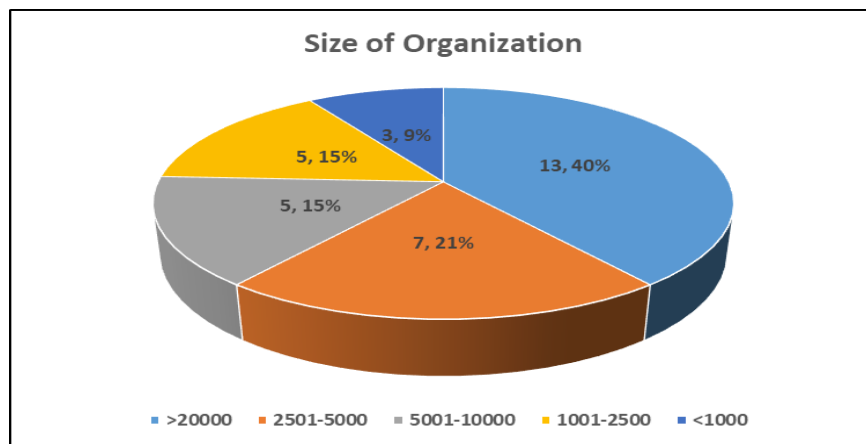
Source: Author's work.

Figure 9: Sector vs Size of the organization



Source: Author's work.

Figure 10: Sector vs Size of the organization



Source: Author's work.

Department

Out of 33 participants, the majority of participants 30% (10/33) were working in Marketing and Sales, followed by 9% (3/33) working in IT and R& D departments respectively. Around 6% (2/33) participants were working in Consulting, Manufacturing, Regulatory affairs, and Supply Chain departments whereas 3% (1/33) each came from

Business Development, Clinical Development, Engineering & Instrumentation, Finance, HR, Medical Affairs, Operations, Product Development. This depicts distribution of wide range of functional role within pharmaceutical industry, with relatively lower participation from support group than core pharma areas. Department wise breakdowns are given in Table 8 and Figure 11 below:

Table 8: Department of Interview Participants

Department	# of Interview Participant	
Marketing & Sales	10	30%
IT	3	9%
R&D	3	9%
Consulting	2	6%
Manufacturing	2	6%
Regulatory Affairs	2	6%
Supply Chain	2	6%
Business	1	3%
Business Development	1	3%
Clinical Development	1	3%
Engineering & Instrumentation	1	3%
Finance	1	3%
HR	1	3%
Medical Affairs	1	3%
Operations	1	3%
Product Development	1	3%
Total	33	

Source: Author's work.

Figure 11: Department of Interview Participants



Source: Author's work.

Designation

Out of 33 participants, the largest proportion of participants 15% (5) consisted Project Managers indicating strong representation of leadership roles. This was followed by Regional Managers and CEOs, comprising 12% (4) each. Senior Managers and AVP consisted 9% (3) each. Area Business Manager and Director comprised of 6% each (2). A smaller proportion 3% each (1) participants were working Business Manager, CFO, Consultant, Country Head, General Manager, Head-Product Development, Program Manager, Vice President, Zonal Head, and Zonal Business Manager. This shows wide range of functional role within pharmaceutical industry. Table 9 provide designation wise breakdowns.

Table 9: Designation wise Distribution of Interview Participants

Role Played	Count of participants	%
Project Manager	5	15%
Regional Manager	4	12%
CEO	4	12%
Senior Manager	3	9%
AVP	3	9%
Area Business Manager	2	6%
Director	2	6%
Vice President	1	3%
Consultant	1	3%
Zonal Head	1	3%
Business Manager	1	3%
Country Head	1	3%
Head - Product Development	1	3%
Zonal Business Manager	1	3%
Program Manager	1	3%
CFO	1	3%
General Manager	1	3%
Total	33	

Source: Author's work.

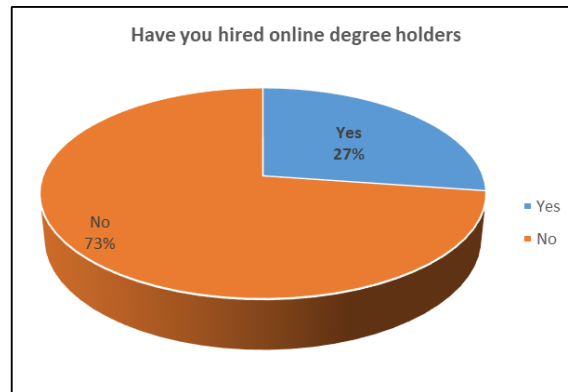
Employers' Hiring Experience and willingness to recruit online degree holders

Recruitment of candidates with online degrees

Out of 33 participants, 27% (09) had hired candidates who completed degrees through online/ distance education universities. Whereas, 73% (24) had not hired any

candidate who had degree online/distance institutes. Collectively, the findings show measured acceptance of online degree with due cautions.

Figure 12: Hired Online Degree Holders



Source: Author's work.

Identifying Online Degree and Hiring Outcomes

Verifying of Degree Delivery Mode: Online vs Offline

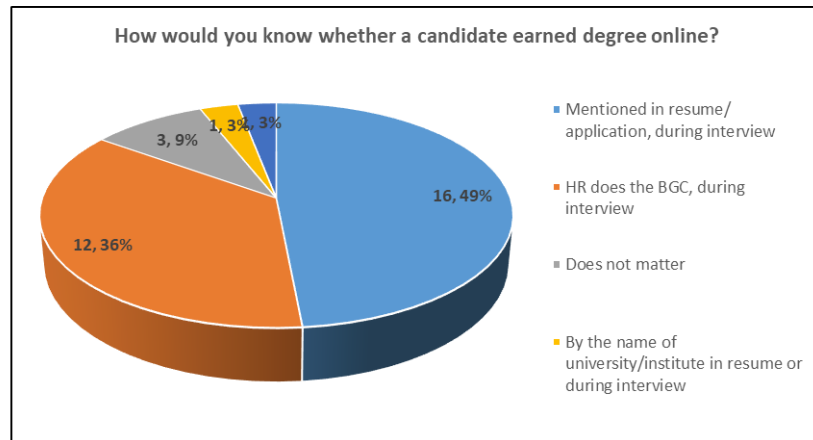
When participants were asked how would they verify if the candidate's degree was earned through online mode, they reported several verification methods. Out of 33 participants, largest proportion 49% (16), reported that this information is provided in resume or application or asked during interview. Another 36% (12/33) relied on background verification checks by HR or asked during interview, while 9% (3/33) showed indifference. A small percentage of respondents 3% each (1/33) said that HR explicitly selected online universities for job interview, while others mentioned they would recognize by the name of university/institute written in resume or clarify during interview. Details are given in Table 10 and Figure 13 below:

Table 10: Verifying of Degree Delivery Mode: Online vs Offline

Mode of Verification	# of Participants
Mentioned in resume/ application, during interview	16
HR does the BGC, during interview, written in resume	12
Does not matter	3
By the name of university/institute in resume or during interview	1
HR selected complete online universities to select candidates from.	1
Total	33

Source: Author's work.

Figure 13: Verifying of Degree Delivery Mode: Online vs Offline



Source: Author's work.

Recognizing Online Degrees and Hiring Experience with Online Degree Holders

Out of 33 participants, 27% (9/33) had hired candidates with online/distance education degrees and their response were recorded regarding how they identified the candidates have online degrees. Majority of participants 15% (5/33) reported the most common method was HR doing BGC and when asked during interview. This was

followed by 6% (2/33) stating online qualification is mentioned in the resume/application or they clarify during interview. Approximately 3% each (1/33) relied on identifying the name of the university/institute, directly asking during interview or the HR selected only the online university for candidate selection.

Out of 33 participants, 55% (18/33) hired candidates with online degrees with conditions such as the graduate level degree is from traditional online institute, candidates have done any professional course or post-graduate course from online university. In this category, majority of participants 33% (11/31) stated that the online degree was mentioned in the resume or they verified during interview. Around 21% (7/33) participants relied on the BGC checks done by HR or asked during interview.

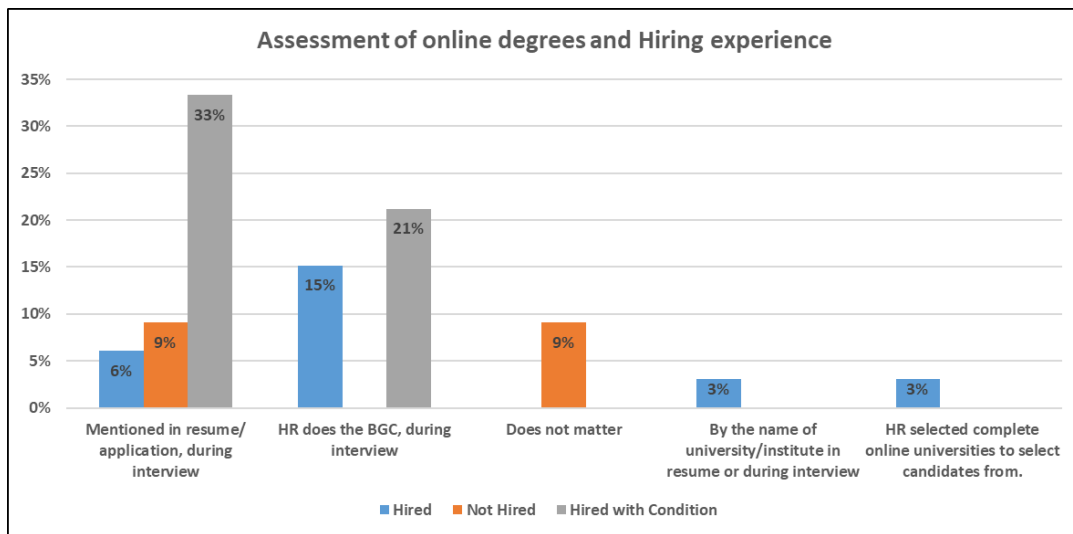
Among respondents who had not hired candidates with online degrees i.e., 18% (6/33), 9% each (3/33) reported that online degree was mentioned in resume/application or clarified during interview or this does not matter to them what was the mode of degree. Detail analysis is provided in Table 11 and Figure 14 below:

Table 11: Assessment of Online Degree and Hiring Experience

Assessment of mode of degree: On-line or Offline	Hired	Not Hired	Hired with Condition	Total
Mentioned in resume/ application, during interview	2	3	11	16
HR does the BGC, during interview	5		7	12
Does not matter		3		3
By the name of university/institute in resume or during interview	1			1
HR selected complete online universities to select candidates from.	1			1
Total	9	6	18	33

Source: Author's work.

Figure 14: Assessment of Online Degree and Hiring Experience



Source: Author's work.

Past Hiring Experience of Online Degree Holders and Future Hiring Willingness

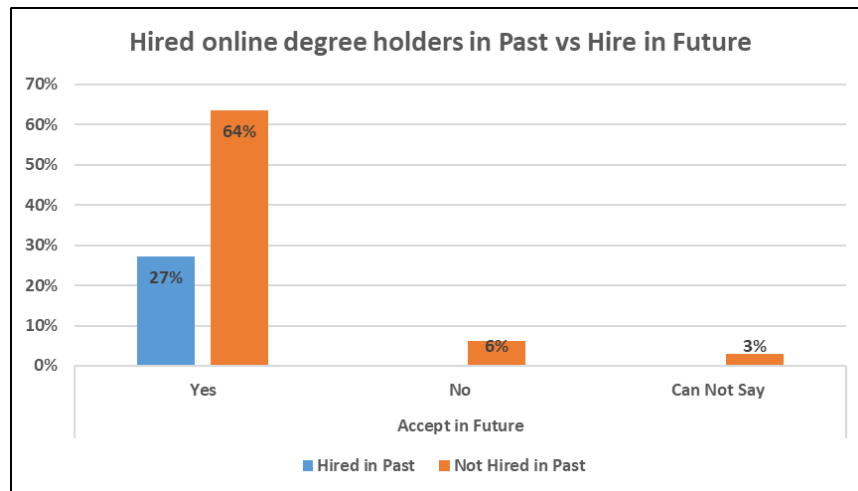
Out of 33 participants interviewed, a majority 91% (30/33) said they intent to accept online degree holders in future. Within this group, 27% (9/33) reported hiring candidates with online degrees in past, whereas 64% (21/33) never hired candidates with online degree. In contrast, 6% (2/33) participants did not express willingness to hire online degree holders in future. These respondents did not have any past experience of hiring candidates with online degrees. The remaining 3% (1/33) stated not recruiting online degree holders in past and was undecisive to recruit in future as well. Detailed analysis is given in Table 12 and Figure 15:

Table 12: Hired Online Degree Holder in Past vs Hire in Future

	Accept in Future			
	Yes	No	Can Not Say	Total
Hired in Past	9			9
Not Hired in Past	21	2	1	24
Total	30	2	1	33

Source: Author's work.

Figure 15: Hired Online Degree Holder in Past vs Hire in Future



Source: Author's work.

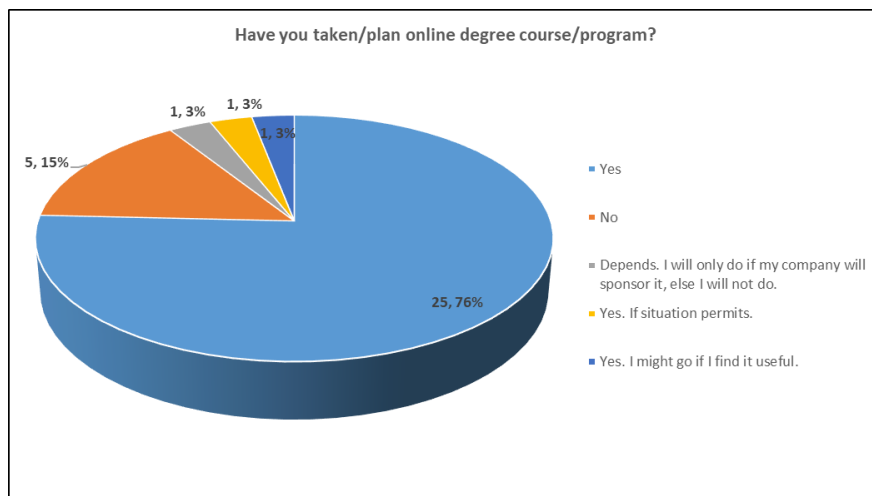
Familiarity with Online Education and Learning Experience

All participants reported substantial exposure to online learning. A majority 85% (28/33) had direct experience with online learning by having online degree, professional course, or job-related online training, CEP or plan to do. Additionally, 94% mentioned indirect exposure to online learning by getting knowledge from their colleagues, friends, online portals, media sources. Around 67% of participants (22/33) expressed willingness to go for online programs if they wish to restart their education.

Direct Personal Exposure with Online Learning

A total 76% (25/33) reported direct exposure to online learning through online degree, online courses, or work-related online training programs. 3% each (1 participant each out of 33) showed willingness to pursue online program if situation permits or find it useful or if the company will sponsor the participants online program. 15% (5/33) participants did not have any experience with online education.

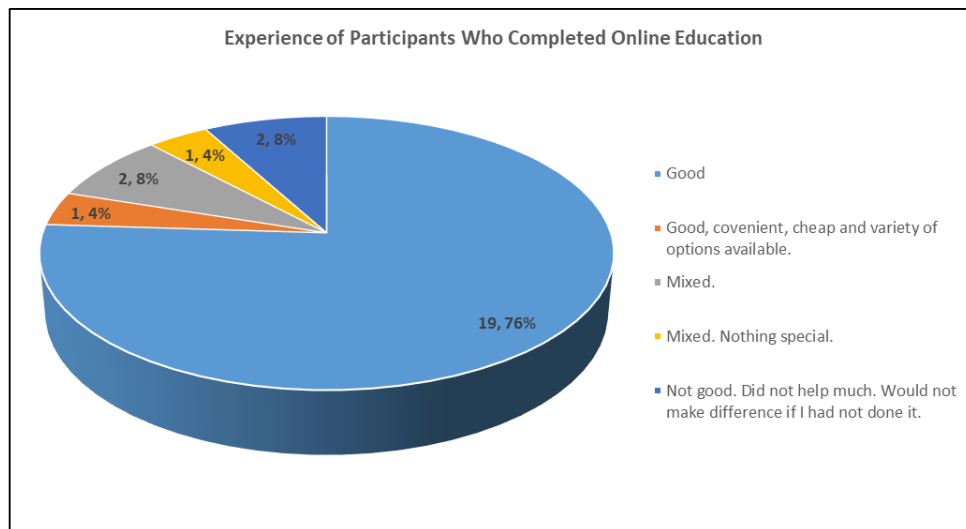
Figure 16: Participants Who Have Taken/Plan to Take Online Education



Source: Author's work.

Among the participants having direct experience with online education a substantial number reported positive opinions. Approximately 76% (19/25) found it good, whereas 8% (2/25) had mixed opinion. 8% (2/25) expressed dissatisfaction with online education stating completing online course did not have any positive outcome. One participant stated it was good, convenient, cost effective and offered variety of choices and the remaining one had mixed experience about online education. Details are given in the Figure 17 below:

Figure 17: Experience of Participants Who Have Done Online Education

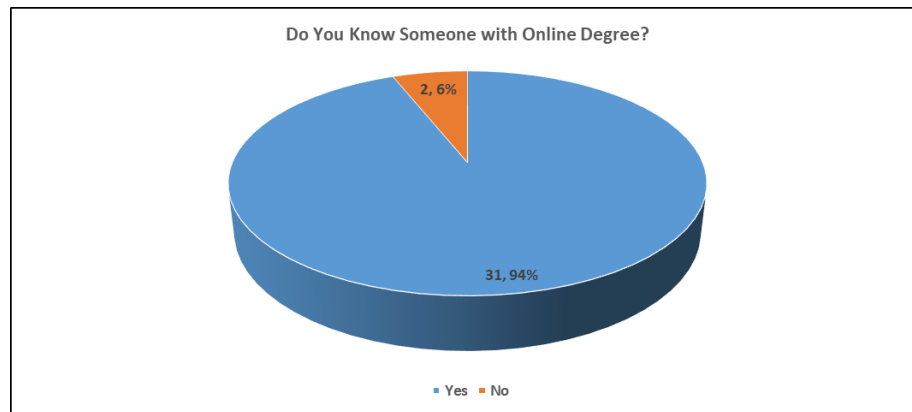


Source: Author's work.

Indirect Exposure of Participants through Other's Experiences

A majority of participants 94% (31/33) reported they knew people who had taken online programs/courses whereas only 6% (2/33) indicated they did not know anyone who has taken online programs/courses.

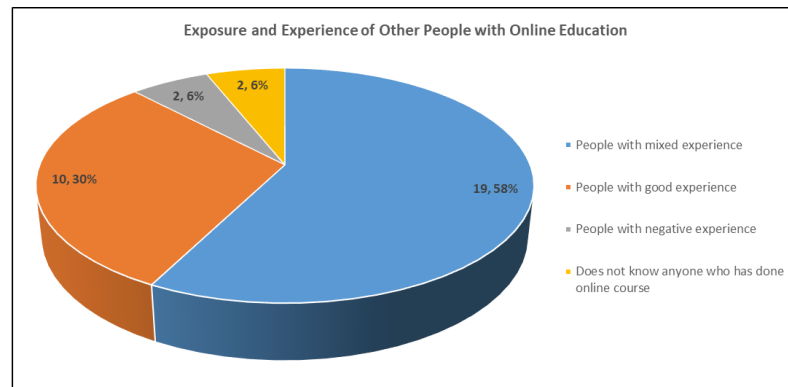
Figure 18: Know Anyone with Online Degree?



Source: Author's work.

Participants who had indirect exposure to online education got different feedback from their acquaintances. Majority of participants 58% (19/33) reported their acquaintances had mixed feedback, as it helps in upskilling and career elevation if done from reputed institute. But they expressed concerns like limited faculty exposure and lab work, lack of seriousness of both students and educators, and less teamwork. Whereas 30% (10/33) had good experience attributed to upskilling, exposure to latest digital technologies, and is par with regular college. A small number 6% (2/33) had negative experience and 6% (2/33) said they did not know anyone who has done an online course.

Figure 19: Exposure and Experience of Other People with Online Education

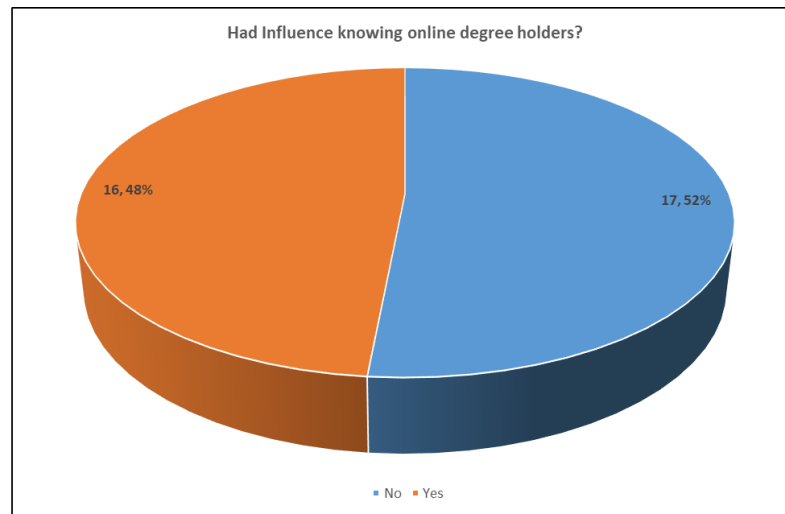


Source: Author's work.

Influence of Knowing Online Degree Holders

There was mixed feedback of participants regarding the influence of acquaintances with online education. Among 33 participants, majority 52% reported knowing someone with online degree did not have any influence on their perceptions regarding online education. Whereas 48% (16/33) indicated that knowing someone with online education made influenced their perception about online education. The results showed that while personal network and experiences influence people in shaping their perceptions regarding online education to a large extent, majority of people remain unaffected by other's experience and have no impact while making their opinion about online education. The details of influence of knowing someone with online degree is given on Figure 20 below:

Figure 20: Influence of knowing online degree holders



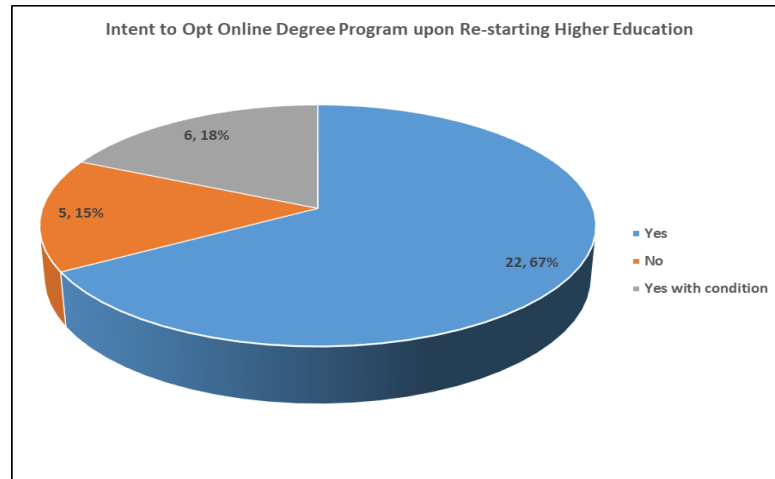
Source: Author's work.

Restart Education

Willingness to go for online education if given opportunity

When participants were asked if they would choose online education if restarting their education, a majority participant 67% (22/33) said they would definitely consider online education to do any course/degree. Approximately 18% (6/33) participants reported online education with condition, such as if the program is company sponsored or offered by a very reputed institute at affordable cost. Whereas 15% participants (5/33) expressed unwillingness to opt for online education as they find these courses as time pass, reputation of the institute, and attitude and willingness of the individual. The detailed analysis is given in the Figure 21 below:

Figure 21: Intent to opt Online Degree Program for Re-starting Higher Education



Source: Author's work.

Key Insights from Participants Interview

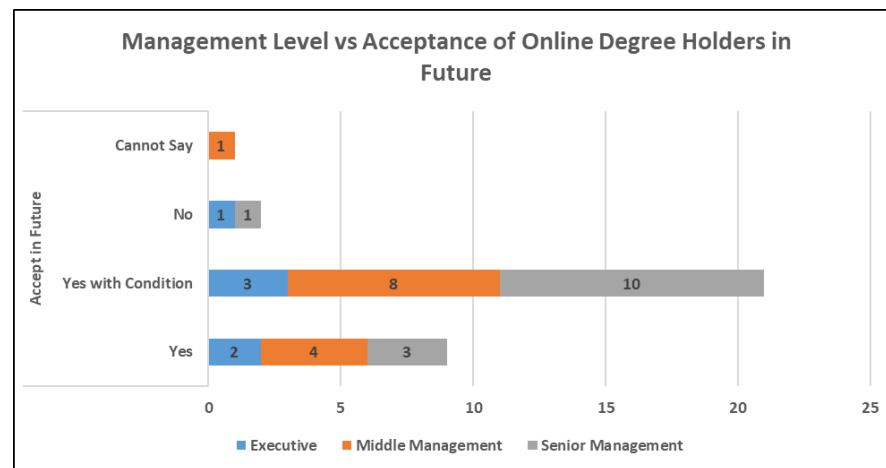
Interview findings largely indicated positive perception of online degrees, despite few concerns and a small number of negative perceptions. Majority of senior management participants 64% (21/33) were ready to accept people with online degrees in future with conditions, such as: company policy, requirements in their department and individual's skill and attitude. Details are given in Table 13 and Figure 22 below:

Table 13: Management Level vs Acceptance of Online Degrees in Future

Management Level	Accept in Future				Total
	Yes	Yes, with Condition	No	Cannot Say	
Executive	2	3	1		6
Middle Management	4	8		1	13
Senior Management	3	10	1		14
Total	9	21	2	1	33

Source: Author's work.

Figure 22: Management Level vs Acceptance of Online Degrees in Future



Source: Author's work.

Size of Company vs Acceptance of Online Degrees

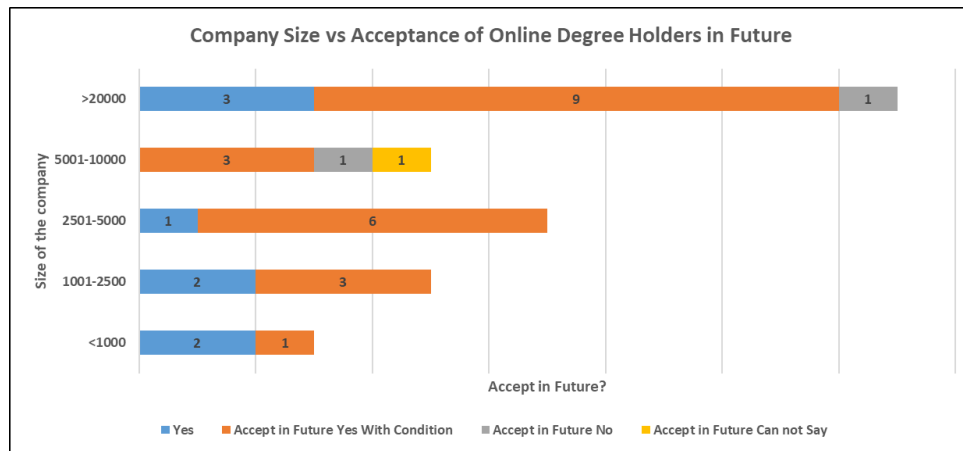
Interview analysis reported that majority participants 27% (22/33) who expressed conditional willingness to accept candidates with online degrees were from large companies with > 20,000 employees. This was followed by participants from companies with 2501-5001 employees 18% (6/33). Also, 24% (8/33) participants reported that they will accept candidates with online degrees with majority 9% (3/33) again from large companies having >20000 employees. A small portion, 3% (1/33) each from 5001-10000 and >20000 employees were reluctant to hire candidates with online degrees and 3% (1/33) from company with 5001-10000 employees was uncertain to hire employees with online education. Detail analysis is given in the Table 15 and Figure 22 below:

Table 14: Size of Company vs Acceptance of Online Degrees

Company Size (No. of Employees)	Accept in Future				
	Yes	Yes, with Condition	No	Cannot Say	Total
<1000	2	1			3
1001-2500	2	3			5
2501-5000	1	6			7
5001-10000		3	1	1	5
>20000	3	9	1		13
Total	8	22	2	1	33

Source: Author's work.

Figure 23: Size of Company vs Acceptance of Online Degrees



Source: Author's work.

Overall, attitude, experience and exposure indicated no clear association, except greater acceptance of online degrees at experienced level in support roles/departments.

Willingness to Opt for Online Education

People who have done/doing online education

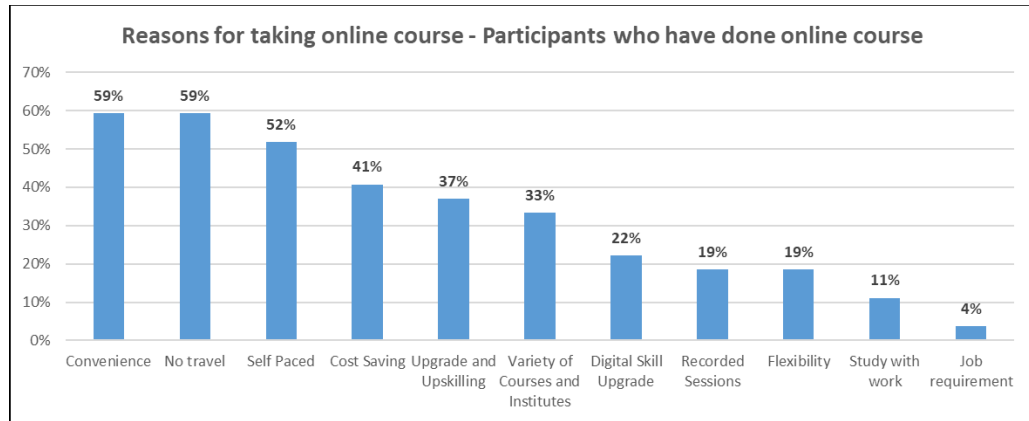
A majority of participants 79% (26/33) had past or current enrolment in online courses/programs for continuous studies, training, course or certification programs. Convenience and no requirement to travel to institutes emerged as primary reasons to choose online courses, reported by 59% (16/27) participants. The detail analysis of factors for choosing online courses is given in Table 15 and Figure 24 below:

Table 15: Factors for Pursuing Online Education – Participants who have experienced online education

Factors for Pursuing Online Education	# Of Mentions
Convenience	16
No travel	16
Self-Paced	14
Cost Saving	11
Upgrade and Upskilling	10
Variety of Courses and Institutes	9
Digital Skill Upgrade	6
Recorded Sessions	5
Flexibility	5
Study with work	3
Job requirement	1

Source: Author's work.

Figure 24: Factors for Pursuing Online Education – Participants who have experienced online education



Source: Author's work.

Reasons cited by participants:

- *“Convenience, flexibility, no travel, Self-paced learning, cost saving, variety of courses, recorded learnings, digital upgrade, AI and other technologies.”*
- *“Being in job and family responsibilities could not go for regular. If we miss classes, then they have recorded sessions which we can go through.”*
- *“I wanted to explore digital health market and that's why I am doing online course on it. Not doing it for promotion/elevating career.”*
- *“Its quick way to get knowledge, can be done from anywhere at own pace, easy availability.”*
- *“My job required MBA degree. So, I did it online.”*
- *“Need to keep pace with changing digital technologies and learn AI and upgrade themselves”*

- *“Upgrade knowledge and rise up in leadership. Basic education was not sufficient.”*

People who have not experienced online education yet

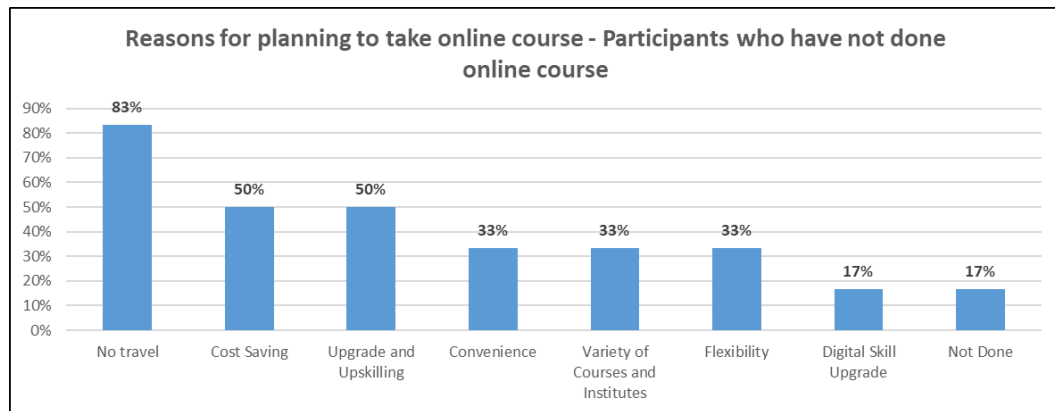
Approximately, 21% (7/33) participants reported they have not enrolled in any online course yet. Among these seven participants, 83% (5/7) said that no need to travel to institutes, followed by cost saving, upgrade and upskilling 42% (3/7) would be the primary factor influencing their decision to opt for online education in future. Detail analysis of factors for choosing online courses is given in Table 17 and Figure 24 below:

Table 16: Factors for Pursuing Online Education – Participants who have not experienced online education

Factors for Pursuing Online Education	# Of Mentions
No travel	5
Cost Saving	3
Upgrade and Upskilling	3
Convenience	2
Variety of Courses and Institutes	2
Flexibility	2
Digital Skill Upgrade	1
Not Done	1

Source: Author’s work.

Figure 25: Factors for Pursuing Online Education – Participants who have not experienced online education



Source: Author's work.

Employers' Decision-Making Preferences in Hiring and Promotion

This study presented two hypothetical scenarios – One for Hiring and other for Promotion. Each scenario involved single vacancy and two applicants. In each scenario interview participants were questioned to compare both candidates and select one as for hiring or promotion.

Preference in hiring

In this scenario, two candidates had same key attributes: age, Bachelors in Pharmacy from an accredited Indian University, work experience of five years in same organization. The only difference between them was mode of education: one candidate completed education through online mode whereas the other candidate through traditional college. Results indicate that 70% participants (23/33) preferred candidates who completed their education through traditional college and all of them perceived that there is difference in education imparted through online vs offline mode. Approximately,

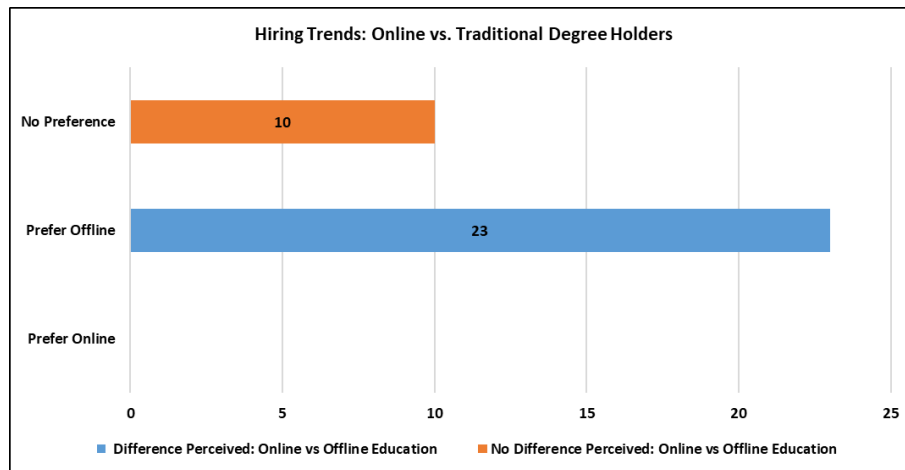
30% participants (10/33) showed no preference in mode of education while hiring and all of them felt that there is no difference in online and offline education. The detail analysis of employers' hiring preference is given in Table 18 and Figure 24 below:

Table 17: Hiring Scenario: Preference in Online vs Offline Education

Prefer Online?	Difference Perceived: Online vs Offline Education	No Difference Perceived: Online vs Offline Education	Total
Prefer Online			
Prefer Offline	23		23
No Preference		10	10
Total	23	10	33

Source: Author's work.

Figure 26: Hiring Scenario: Preference in Online vs Offline Education

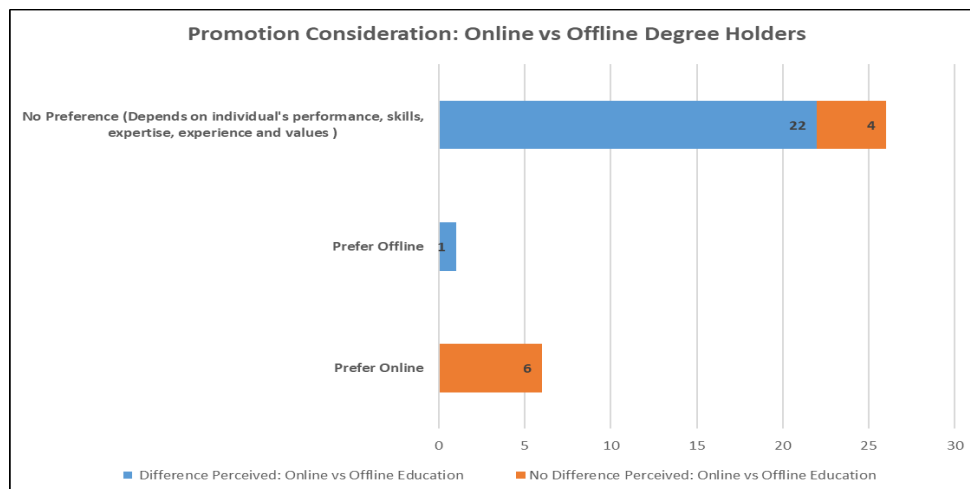


Source: Author's work.

Preference in promotion situations

In the promotion scenario, participants were provided two candidates with same key attributes: age, MBA from an accredited Indian University, position and job role in the same organization, and work experience. The only difference between them was mode of education: one candidate completed education through online mode whereas the other candidate through traditional college. Results indicate that 79% participants (26/33) showed no preference regarding the mode of education during promotion consideration of candidates. They emphasized that individual performance, contribution to the organization, attitude, skills, and willingness to learn were more valuable than mode of education. Among these 26 participants, 85% (22/26) admitted perceived difference in quality of online versus offline mode of education, whereas 15% (4/26) did not feel any difference. Approximately, 18% participants (6/33) indicated preference for candidates with online degree and the remaining 3% (1/33) preferred candidate with offline degree. The detail analysis of employers' promotion preference is given in Figure 27 below:

Figure 27: Promotion Scenario: Preference in Online vs Offline Education



Source: Author's work.

Perceived Value of Online Degrees and Programs

Interview participants were asked questions about their perceptions regarding online degrees and programs.

Perceptions of Online Degrees and Programs

Interview participants were invited to share their thoughts when they hear “Online Degrees” or “Online Programs”. Their responses provided valuable insights into prevailing assumptions and perceptions regarding online education. The results indicate that 55% participants (18/33) had positive attitude towards online education. Common factors for positive attitude towards online education included:

- *“Easiest way to get knowledge. Should be done from authentic and verified institutes.”*
- *“Flexibility, time saving, affordable. silver lining for students who cannot afford costly education.”*
- *“Good way to learn while working. Good if done from reputed institutions and efforts are put.”*
- *“It is good for additional knowledge. Graduation degree from regular institution is must.”*
- *“This is a medium to upskill for working people. Could be fraud, especially from private institutions.”*
- *“Perceptions are changing with improvement in technologies, affordable internet and government support.”*

- *“They have improved a lot since Covid times and it will further improve in coming times.”*
- *“Variety of courses available, different platforms available.”*
- *“Websites with online education. Provide new leverage to do courses from anywhere.”*

In contrast, 27% (9/33) expressed negative perception regarding online education. Reasons cited by respondents with negative perceptions are:

- *“It has less value. Feels like people have learnt from WhatsApp, Google.”*
- *“Not interactive, not focused, no collaboration between faculty and students. Students work in isolation, boring. I will always prefer classroom.”*
- *“Not serious. Knowledge and credibility are doubtful.”*
- *“Useless, money-making institutes, not serious attitude: neither by faculty, nor by students. Students are isolated, no interaction with faculty, peers and other college staff.”*
- *“Useless. Lower level, not able to get into regular college, had financial constraints”*
- *“Very lousy, Fake Degree, time pass, not serious, nothing special.”*

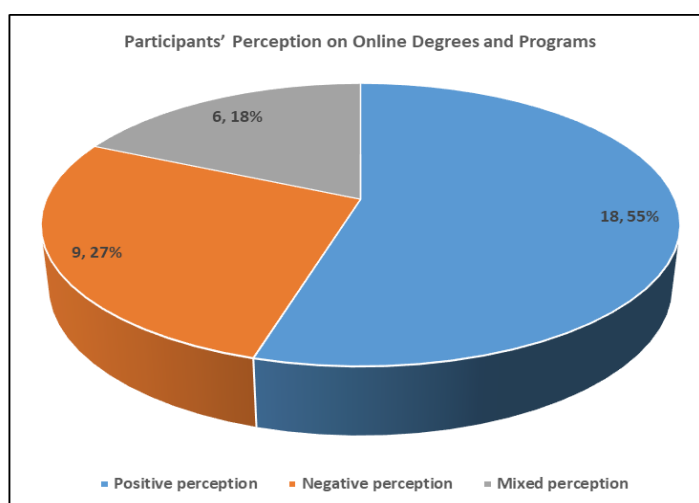
Remaining, 18% (6/33) expressed mixed perception regarding online education citing both benefits and concerns. Reasons cited by respondents with negative perceptions are:

- *“Addendum to regular degree. Cannot replace regular education.”*
- *“Flexibility, no need to travel, dress up, Casual approach, Less discipline”*

- *“Mixed feeling. It depends on person what is their objective, and skill they acquire. Knowledge, skill, and experience matter the most.”*
- *“Flexibility, no commute, not to be in formal attire, Casual approach, Less discipline.”*

The detail analysis is given in Figure 28 below:

Figure 28: Perception Regarding Online Education



Source: Author's work.

Comparative Perspective of Online vs offline Degree/Programs

Participants were asked to present their comparative views about online vs offline degree/programs. The majority of the participants 70% (23/33) indicated traditional offline education is better. The reasons to prefer traditional mode were:

- *“Traditional colleges provide lab and practical experience, interaction with faculty, concentration and focused dedicated time and imparts in-depth knowledge.”*

- *“Online degrees help you to acquire additional knowledge. But traditional degrees give you foundation and necessary knowledge and skills.”*
- *“Offline has more rigor, discipline. It has fellowship, richness of thoughts, concentration and focused dedicated time.”*
- *“Offline graduates have stronger readiness for leadership roles because of in-person exposure and practical interactions.”*
- *“Online learning can give you some extent of exposure but actual learning in pharmaceutical industry comes only through classroom studies and practical experience.”*
- *“Online degrees are not possible where core skills and practical experience is required like research, quality, audit, manufacturing etc.”*
- *“Quality of Online education is doubtful, substandard.”*
- *“Basic college degree is must. Online education is for additional*
- *degrees.”*
- *“Online courses are quick and too fast-paced, which raises concerns about their academic rigor.”*
- *“No university in India provides practical for science related courses.”*

A small population, 15% (5/33) expressed that both traditional and online modes are equally good as it depends on the individual, knowledge and skills. In contrast, 12% (4/33) found online mode better. Reasons were:

- *“Online degree programs quickly align as per industry needs, whereas regular college programs take too much time to update their courses and content.”*

- *“Online education is future and needs to be structured and promoted.”*
- *“Online programs require lot of self-discipline, requires work and time balance. These programs can be done from anywhere in the world at self-pace.”*
- *“Online degrees adapt quickly to market needs, have short duration and can be done anywhere from the world.”*

The remaining 3% (1/33) had no clear preference regarding the efficiency of these two modes of education. Detail analysis is given in Table 19 below:

Table 18: Comparative Perspective of Online vs offline Degree/Programs

Which one is better?	# of Participants
Offline Better	23
Both are good	5
Online better	4
No views	1
Total	33

Source: Author’s work.

Importance of Reputation of Education Institution on Hiring Decision

When participants were asked if the reputation of educational institutes impacts hiring decision, majority 87% (30/33) highlighted that the reputation of institute is very important as premier institutes offer credibility, high-quality courses, proven academic record, and transparent assessment. On contrast, 9% (3/33) indicated that reputation of institute is irrelevant as most of the institutes are useless, exist to make money and it is more about an individual’s effort. Remaining 3% (1/33) said it matters but employers

need to validate the knowledge and competency of the candidate irrespective of institute.

Detailed analysis is given in Table 20 below:

Table 19: Importance of Reputation of Education Institution on Hiring Decision

Do Reputation of Institution Matters?	# of Participants
Yes	29
No	3
Yes, with Condition	1
Total	33

Source: Author's work.

Perception of Academic Rigor and Credibility of Online Degrees

When participants were asked if the online education offers same level of academic rigor and credibility as traditional institutes, 57% (19/33) reported that the rigor and credibility of online education is not at par with traditional institutes. In contrast, 36% (12/33) indicated that the academic rigor and credibility is good and largely depends on the institutes and faculty. Remaining 6% (2/33) reported mixed feeling stating that while some institute offer good education, they cannot be compared with traditional colleges that provide faculty – student interaction, lab exposure and people management.

Detailed analysis is given in Table 21 below:

Table 20: Perception of Academic Rigor and Credibility of Online Degrees

Do Online Degrees have same Academic Rigor and credibility as online degrees?	# of Participants
No	19
Yes	12
Mixed	2
Total	33

Source: Author's work.

Organizational Policy on Recruiting Online Degree Holders

To understand the readiness of pharmaceutical companies to hire candidates with online qualifications, participants were asked whether their organization had a policy to hire online degree holders. the majority of respondents, 57% (19/33) indicated that their organization does not have any formal policy and minimum graduation level degree from traditional college is must. 24% participants (8/33) informed that their organization does not have any policy to hire online degree holders, whereas 6% (2/33) expressed unawareness regarding this. A smaller proportion, 3% (1/33) from each, reported existence of policy to hire online degree holders or permitting recruitment of candidates with online degrees in addition to a traditional college degree with minimum 60% marks. Additionally, 3% (1/33) did not want to share their company's policy and remaining one participant's 3% (1/33) organization did not to hire online degree holders. The detail analysis is given in Table 22 below:

Table 21: Organizational Hiring Policy for Online Degree Holders

Your organization has policy to hire online degree holders?	# of Participants
No. Minimum graduation level degree from Regular college Required	19
No	8
I am Not Aware	2
Yes	1
Yes. Minimum graduate level degree with 60% from traditional college is required.	1
I do not want to divulge	1
We do not hire online degree holders	1
Total	33

Source: Author's work.

Organization's Encouragement for Online Education

To assess if the pharmaceutical companies support online education for the professional development of its workforce through digital learning modes, participants were questioned whether their organizations encourage employees to pursue online education/degrees/certification. The majority of participants, 88% (29/33) confirmed that their organization encourages online education. Among these 29 respondents, 16 reported their organization sponsors online education, and three participants said their organizations support online courses, but do not sponsor. In contrast, 12% participants (4/33) indicated that their organization does not encourage online courses. The detail analysis is given in Table 23 below:

Table 22: Organization's Encouragement for Online Education

Your organization encourages Online education?	# of Participants
Yes. We sponsor also.	16
Yes	10
Yes. But we do not sponsor.	3
No	4
Total	33

Source: Author's work.

Acceptance of Online Degree based on Experience Level

Participants were asked at what experience level companies hire more online degree holders. This was to gain insights of the preference level of companies while evaluating online. Results showed that maximum number of participants 84% preferred to hire candidates with sufficient experience in pharmaceutical industry as hands-on experience, team work and exposure to real world is important. In contrast, only 9% participants (3/33) said candidates with online degrees could be considered at any level: Fresher or Experienced. A smaller proportion, 3% (1/33) from each, reported that experience level either would not influence their decision while hiring or they were unsure about the effectiveness of the online qualification as they placed greater value to competencies, attitude and skill offered by the candidate than mode of education. A detailed analysis is given in Table 24 below:

Table 23: Acceptance of Online Degree based on Experience Level

At what experience Online Degree is acceptable?	# of Participants
Experienced	28
Any Position	3
No Idea	1
No Impact	1
Total	33

Source: Author's work.

Organization's Preferred Departments for Hiring Online Degree Holders

Participants were asked which department is most suitable for hiring online candidates to understand departmental acceptability and underlying factors. The results showed that majority of participants 48% (16/33) indicated that candidates with online degrees are most suitable for support departments such as Admin, HR, Sales, Marketing, Product Development, Learning and Training, Inventory etc. Approximately, 21% participants (7/33) reported that online degree holders could be hired in all departments including R&D, Medical Affairs, Clinical Trials, and Manufacturing but they basic college education from traditional college is must. In contrast, 12% of participants (4/33) said online qualified candidates are not fit for any department. Additionally, 6% (2/33) reported they are suitable for IT department where continuous digital upgrade is necessary. Many participants emphasized that online education is useful as additional way to regular college degrees to upgrade and upskill related to latest technologies, regulation, compliance, quality and audit departments. A small proportion of participants 6% (2/33) each reported either they do want to disclose this information or unsure about this. A detailed analysis is given in Table 25 below:

Table 24: Preferred Departments for Online Degree Holder

Preferred Departments for Hiring Online Degree Holders	Count
Support Departments like HR, Admin, Marketing, Sales, Product Management, Learning and training	16
All Departments depending on knowledge and skill	7
Not fit for any department	4
Technical Department	2
Do not want to answer	2
No Idea	2
Total	33

Source: Author's work.

Impact of Online Education in Leadership Skill Development

Participants were asked to share their views whether online degrees/programs help in developing leadership skills among working professionals. Responses of participants reflected their varying views about role of online learning in professional development of individuals beyond their technical expertise. 51% (17/33) participants reported that online degrees help to develop leadership qualities. Reasons were:

- *“Useful if the knowledge is showcased correctly”*
- *“Blended learning helps the person who gets the knowledge and grooming and then implement this with their experience, knowledge and people management.”*
- *“It provides an edge if they can showcase the knowledge they gained.”*
- *“They learn many leadership skills and if implemented correctly will help to grow in leadership.”*

In contrast, 36% participants (12/33) said it does not help in developing leadership skills, while 12% (4/33) indicated it may or may not help depending on the person. Reasons were:

- *“it depends on the person how they utilize the knowledge they gained”*
- *“These online degrees can give you knowledge, but practical leadership comes over years with people management.”*
- *“Real time experience is must. This cannot be taught in digital classes.”*
- *“People are doing online courses for promotion only. Not focused on quality and content.”*

Table 25: Impact of Online Education in Leadership Skill Development

Online degree helps in developing leadership qualities?	# of Participants
Yes	17
No	12
Mixed	4
Total	33

Source: Author’s work.

Advantages of Hiring Online Degree Holders

Participants were questioned whether there are advantages of hiring people with online degrees and what are the reasons influencing their decisions. A majority of participants, 67% (23/33) admitted there are advantages in hiring online degree holders due to following reasons:

- *“Person with experience and knowledge, digital skill, quality or subject-matter related knowledge are valuable.”*

- *“More exposure to digital technologies, latest trends, more disciplined”*
- *“You have variety of candidates, people with latest skill.”*
- *“They are talented as they are managing job and education simultaneously.”*
- *“In case of experienced employees, we look for skillsets a candidate will bring.”*
- *“Digital knowledge, can adapt to changing technologies fast.”*
- *“One comes with lot of maturity and higher readiness for profession.”*
- *“Helps people to learn digital technologies, latest processes and updates.”*

While 33% (10/33) participants indicated they perceived no special advantages in hiring candidates with online degrees.

Table 26: Advantages of Hiring Online Degree Holders

Any Advantages of Hiring Online Degree Holders	# of Participants
Yes	23
No	10
Total	33

Source: Author’s work.

Disadvantages of Hiring Online Degree Holders

Participants were questioned whether there are disadvantages of hiring people with online degrees and what are the reasons influencing their decisions. A majority of participants, 90% (30/33) admitted there are disadvantages in hiring online degree holders due to following reasons:

- *“Quality is doubtful, knowledge is superficial, no depth in knowledge, most of the time people do for time pass.”*

- *“Anyone can open an online course as it does not require any physical setup, faculty education, examination and credibility is doubtful.”*
- *“They lack leadership qualities, team handling and presentation skills.”*
- *“Communication skill lacking, real time experience not there.”*
- *“In-sufficient practical and hands-on experience, lacks knowledge of equipment and tools features and functions.”*
- *“Limited exposure of real-time industry specific problems.”*
- *“Lack communication and interpersonal skills.”*
- *“Less confidence, no people-management skill, people management, and lack team-work”*

In contrast, 6% (2/33) reported there are no specific advantage or disadvantage of hiring online degree holders stating:

- *“One has to ensure that it is a genuine certificate, institutions and not a fake degree.”*
- *“We have to wait and give time to candidate to show if they perform what they claimed during interview.”*
- *“Whereas one participant 3% (1/33) never hired any candidate with online degrees.”*

Table 27: Dis-advantages of Hiring Online Degree Holders

Disadvantages of Hiring Online Degree Holders	# of Participants
Yes	30
Mixed	2
Never Hired Online Degree Holders	1
Total	33

Source: Author's work.

Motivation for Pursuing Online Education

Participants were asked the factors influencing an individual to opt for online education. In the rapidly evolving industrial demands both at technology and core domain skills, it is important to understand personal, professional and organizational drivers that impacts people's decision to pursue online education. Reasons cited were: Skill enhancement and technological upgrade, flexibility of time and location, no need to travel, cost effectiveness, wide-variety of courses as per need, career progression, promotion opportunities, allows study along with professional and personal responsibilities, work-personal life balance and so on. Participants cited:

- *“Provides opportunity for working professionals, provides immense number of courses, saves commute time, skill enhancement, Cost effective”*
- *“Upskill, continue learning lifelong, immense choice of courses from global universities, cost effective, saves time, gives flexibility to learn with job”*
- *“Short term courses on digital skills, management, negotiation skills are much preferred. Makes them future ready.”*
- *“Course material is advanced and broad. Anytime Anywhere. Collaboration with reputed institutes.”*

- *“To upskill and get promotion”*
- *“Availability, flexibility to complete course at any time, opportunity to get global level courses from anywhere in the world.”*
- *“Professionals cannot go to regular colleges, want to gain additional knowledge, digital technologies, new skills.”*

Strategies for Institutions to Enhance Acceptability of Online Education by Employers

Participants were asked to suggest steps that institutes could take to increase the acceptability of Online degrees by employers in Indian Pharmaceutical Industry. The question was aimed to identify strategies that institutes can implement to enhance the credibility and acceptance of online degrees. Responses highlighted key improvements related to quality, transparency, academic-industry alignment, accountability, and policy-related changes:

- *“Provide real-time experience, industry case studies, practical knowledge”*
- *“Select good faculty, take accountability, giving assignments on real-time problems.”*
- *“They should regularly update courses, offer courses on industry requirements, and collaborate with industry regularly.”*
- *“Stringent evaluation system at regular intervals, transparent evaluation process and update courses.”*

- *“Introduce hybrid course to give exposure to practical aspects, include latest digital courses, have exchange programs with other institutes, collaborate with industry to understand their needs and introduce tailored courses.”*
- *Tie-up with regular college to provide hands on experience, practical knowledge. Take testimonials from passed out students, how they applied their learning so that other people get inspired.*
- *“Make evaluation process transparent, institutes, courses offered by them should be monitored by independent agency, bring already passed out candidates who got job to share their experience, give real time industry case studies”*
- *“Give practical knowledge as well, send them for internship to get industry experience”*

Measure for Online Degree Holders to Enhance Acceptability by Employers

Participants were asked to propose measures that individuals who have online degrees or those planning to enroll in online programs should adopt to increase their acceptability by the employers in Indian Pharmaceutical Industry. Their responses emphasized on key strategies related to experience, selection of institute and courses, exposure to real-world problems, showcasing projects implementation, and building networks:

- *“Highlight projects undertaken in resume, showcase skill set by doing internships, students need to be active, and take internships.”*

- *“Showcase during interview and implement the knowledge you gained during online learning. Focus on your knowledge, project undertaken and how relevant it is for industry”*
- *“They should develop network, be more visible in the online world on various platforms through writing or blogging meaningful content, demonstrates your knowledge acquired through course.”*
- *“Gain the knowledge, understand concepts, be attentive, complete projects and tell in your resume.”*
- *“Select college with good reputation, demonstrate job-readiness, get industry exposure, build projects on current industry problems, connect with industry people on social media.”*
- *“Candidates need to do background check about the organization/ hiring manager. Be prepared accordingly and prove that you are better than them.”*
- *“Firstly, do a lot of internship programs with some organization with hands-on type of thing. Secondly, do networking. Thirdly, publish papers.”*
- *“They must start from Grassroot and learn the industry basics irrespective from which institute you are coming.”*
- *“Be truthful about your education and knowledge, mention courses names and details, project details if taken, avoid mentioning online in Resume. Mention only if asked by interviewer.”*
- *“Professionals should have basic regular education and then take online education as additional to upskill, in-depth knowledge in a specific subject/topic.”*

4.1.2 Research Survey

A personalized message was sent LinkedIn, Email, and social media messaging services to 2000 professionals working in Indian Pharmaceutical companies across India. The message contained a hyperlink to the research survey hosted on Google Forms. Out of these messages, 450 individuals responded. However, only 359 surveys were fully completed and included in the analysis; incomplete responses were not used for this study. The research survey effectively recorded perceptions of Indian Pharmaceutical employers regarding the acceptability of online degrees. The demography of participants showcased diversity across gender, size of organization (small to large enterprises), age group (under 25 to above 55), education (graduate, professional degree, doctorate), Designation (CEO, Senior Management, Middle Management, Junior Management, Non-management), cities (metro-politan and non-metropolitan) and experience with online education, ensuring a wide representation sample for the research.

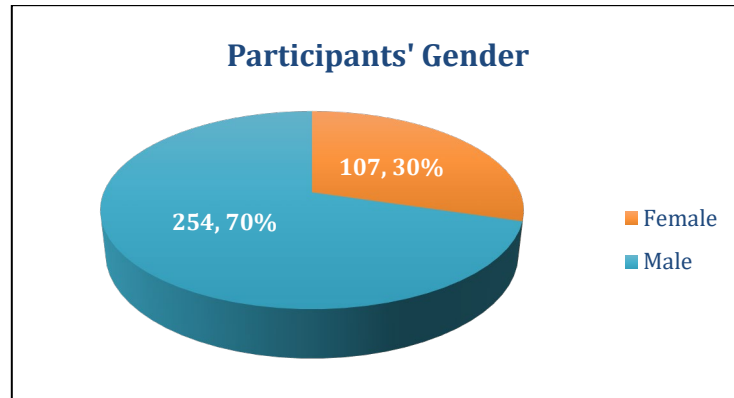
Participant Demographics

The age of the participants was from under 25 years to above 55 years. Out of 361 responses, 254 participants were male and 107 were female. Table 28, along with Figure 28. Figure 30, present a comprehensive view and analysis participants' gender, age range along with their highest level of education.

Gender of Participants

Out of 361 participants, 254 participants i.e., 70% were male, and 107 participants i.e., 30% were females.

Figure 29: Participants' Gender



Source: Author's work.

Age and Gender of Participants

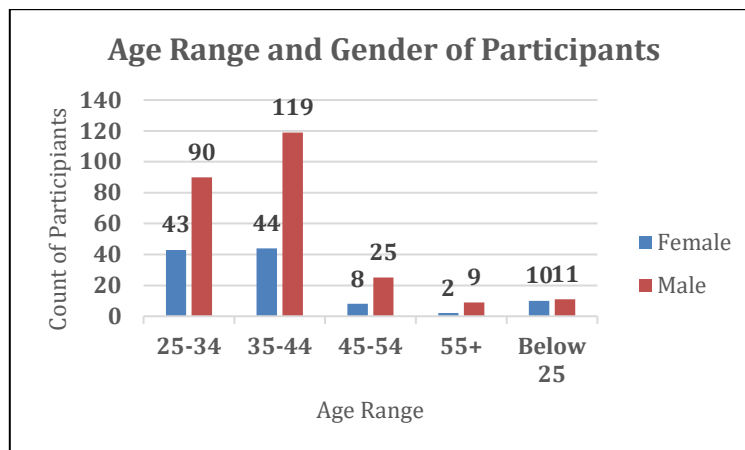
The maximum share of participation across both genders was from individuals of age range 35 to 44 years, representing 45% of participants. This was followed by participants of age range 25 to 34 years, representing 37% of participants. The remaining participants were from age range 45 to 54 years, below 25 years, and above 55 years, representing 9%, 6% and 3% to 9%, respectively.

Table 28: Age Range and Gender of Participants

Age Range	Female	Male	Total	Percentage
25-34	43	90	133	37%
35-44	44	119	163	45%
45-54	8	25	33	9%
55+	2	9	11	3%
Below 25	10	11	21	6%
Total	107	254	361	

Source: Author's work.

Figure 30: Age Range and Gender of Participants

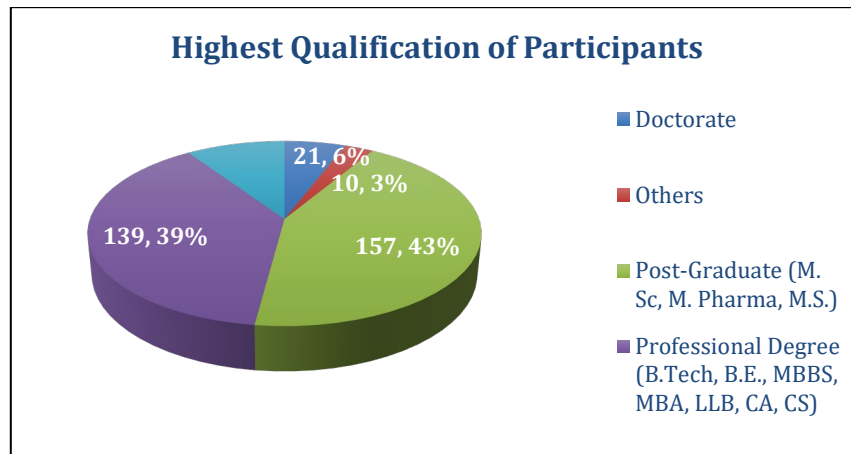


Source: Author's work.

Highest Qualification of Participants

Out of 361 participants, highest number of participants 157 i.e., 43% held post-graduate degree, whereas 139 i.e. 39% held professional degree. A smaller portion of participants, 34 i.e. 9% held university degree such as B.A., B.Sc, B.Pharm, B.Com, etc and 21 participants i.e. 6% had Doctorate degree. Remaining 10 participants i.e., 3% had other educational qualifications. Detail analysis is given in Figure 31:

Figure 31: Highest Qualification of Participants

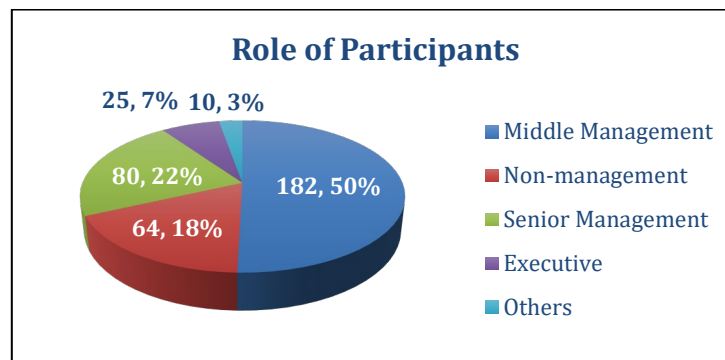


Source: Author's work.

Role of Participants in the Organization

Out of 361 participants, 50% (182 participants) were working at Middle Management level, 22% (80 participants) were working at Senior Management roles, non-management roles were represented by 18% (64 participants), Executive positions were represented by 7% (25 individuals), and remaining 3% (10 individuals) did not disclose their role. Details are given in Figure 32 below:

Figure 32: Role of Participants



Source: Author's work.

Sector Vs Size of Organization

Out of 361 valid responses, the majority of participants 80% (309 individuals) were employed in the private sector, followed by 19% (69 individuals) in the public non-governmental sector, and only 1% (3 individuals) were working in the government sector.

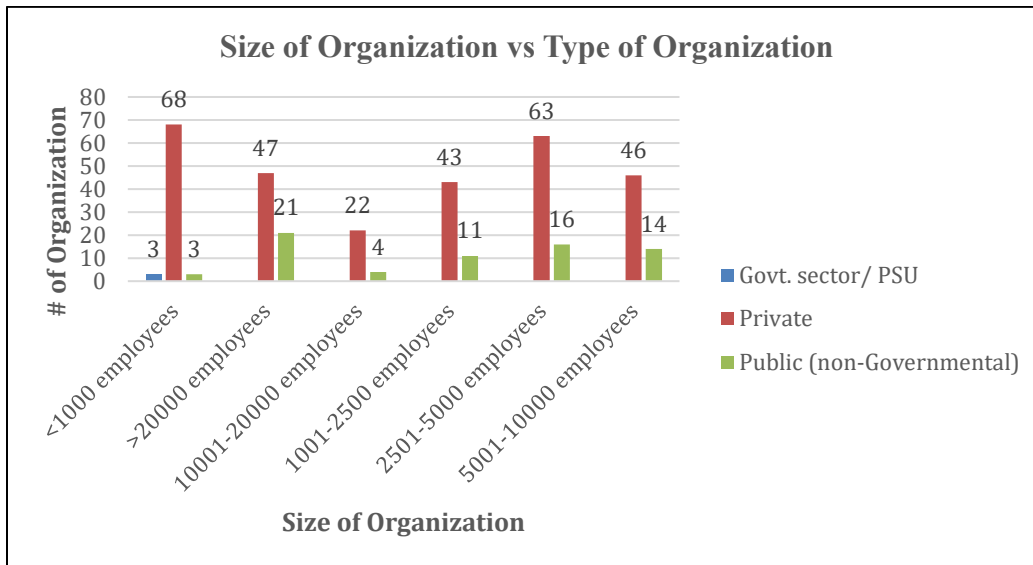
Regarding organizational size, maximum number of people 22% (79 individuals) were working in 2501-5001 worked in small to medium size organizations, followed by 20% (74 individuals) working in <1000 employees' small organization. About 19% (68 individuals) worked in large organization with more than 20,000 employees and 15% (54 individuals) worked in small-sized organizations with 1001-2500 employees. A smaller proportion 7% (26 individual) were employed in medium-sized organizations with 10001-20000 employees. Table 30 and Figure 32 to Figure 34 provide sector and organization size analysis.

Table 29: Size and Type of Organization

Type								
Number of employees	Govt. / PSU	%	Private		Public (non-Govt)	%	Total	
<1000	3	1%	68	19%	3	1%	74	20%
>20000		0%	47	13%	21	6%	68	19%
10001-20000		0%	22	6%	4	1%	26	7%
1001-2500		0%	43	12%	11	3%	54	15%
2501-5000		0%	63	17%	16	4%	79	22%
5001-10000		0%	46	13%	14	4%	60	17%
Total	3	1%	289	80%	69	19%	361	

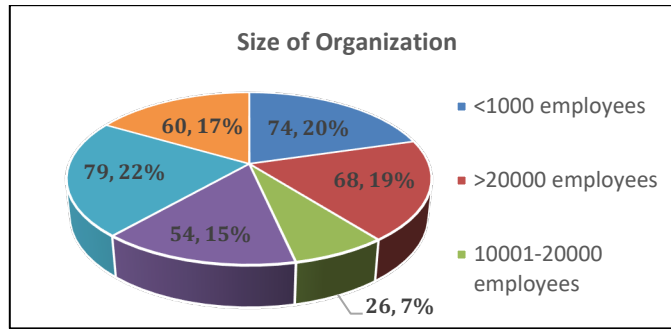
Source: Author's work.

Figure 33: Size and Type of Organization



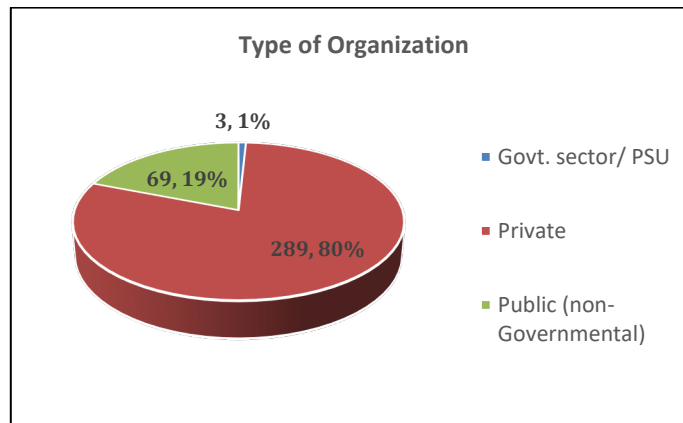
Source: Author's work.

Figure 34: Size of Organization



Source: Author's work.

Figure 35: Type of Organization



Source: Author's work.

Size and City of Organization

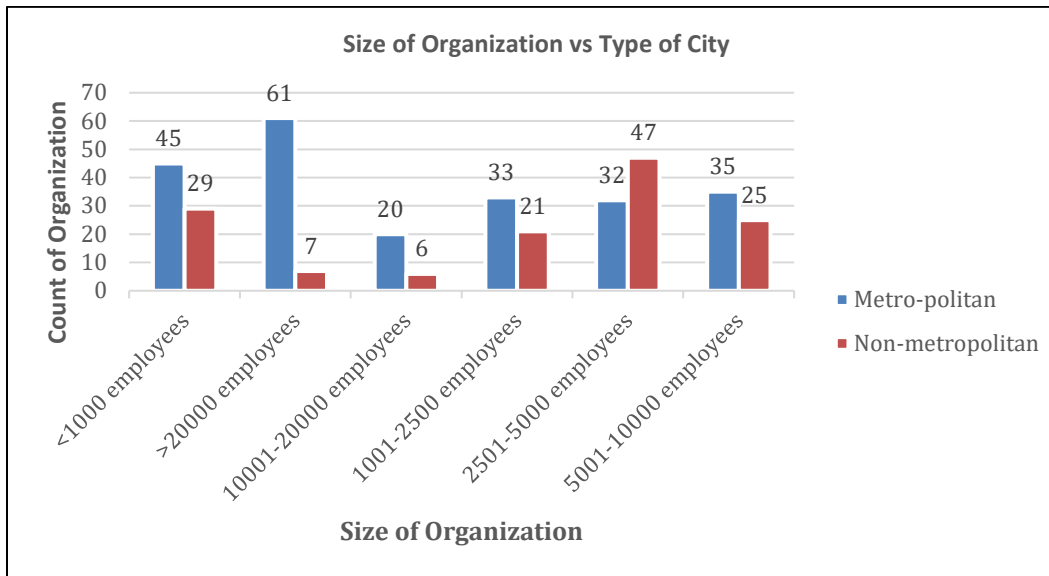
Out of 361 valid responses, most participants 17% (61 individuals) were from metro-politan cities employed in large companies with >20000 employees, followed by 13% participants from non-metropolitan cities employed in small sized companies with 2501-5001 employees. A small number of participants, 2% (7 individuals) and (6 individuals) were from non-metro-politan cities with >20000 and 10001-20000 employees each. Detailed analysis is given in Table 30 and Figure 35:

Table 30: Size of Organization vs Type of City

Type of City						
Size of Employees	Metro-politan		Non-metropolitan		Total	
<1000	45	12%	29	8%	74	20%
>20000	61	17%	7	2%	68	19%
10001-20000	20	6%	6	2%	26	7%
1001-2500	33	9%	21	6%	54	15%
2501-5000	32	9%	47	13%	79	22%
5001-10000	35	10%	25	7%	60	17%
Total	226	63%	135	37%	361	

Source: Author's work.

Figure 36: Size of Organization vs Type of City



Source: Author's work.

Participants Experience with Online Education

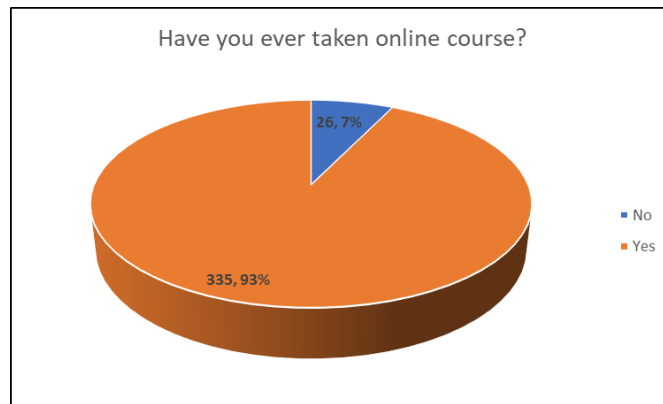
Out of the 361 survey participants, 93% (335 individuals) had experience with online learning, whereas only 7% (26 individuals) did not have any experience with online learning. Regarding the type of courses pursued online, 54% (194 individuals) had completed Continuing Professional Education (CPE) courses, 12% (44 individuals) had undertaken graduate-level courses, 7% (26 individuals) had taken doctoral-level courses and 2% (6 individuals) have taken under-graduate level courses. Additionally, 18% (65 individuals) had taken online courses that is not listed in list. Table 31 along with Figure 36 and Figure 37, provides a detailed breakdown of these findings.

Table 31: Type Online Course Taken by Participants

Type of Course	Have you ever taken online course?	
	No	Yes
Doctorate		26
Not Applicable	26	65
Graduate		44
CPE		194
Undergraduate		6
Total	26	335

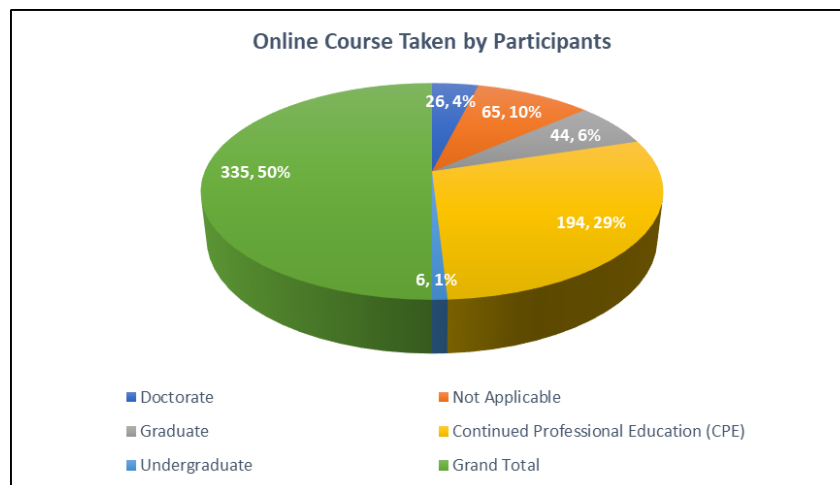
Source: Author's work.

Figure 37: Ever taken online course?



Source: Author's work.

Figure 38: Type of Course taken by Participant



Source: Author's work.

Size of organization vs Online Course Taken

Regarding the size of organization and online courses undertaken by participants, 13% (43 individuals) had completed Continuing Professional Education (CPE) courses from small sized organization with 2501-5000 employees, followed by 12% (41 individuals) and (40 individuals) pursuing CPE courses from small organization

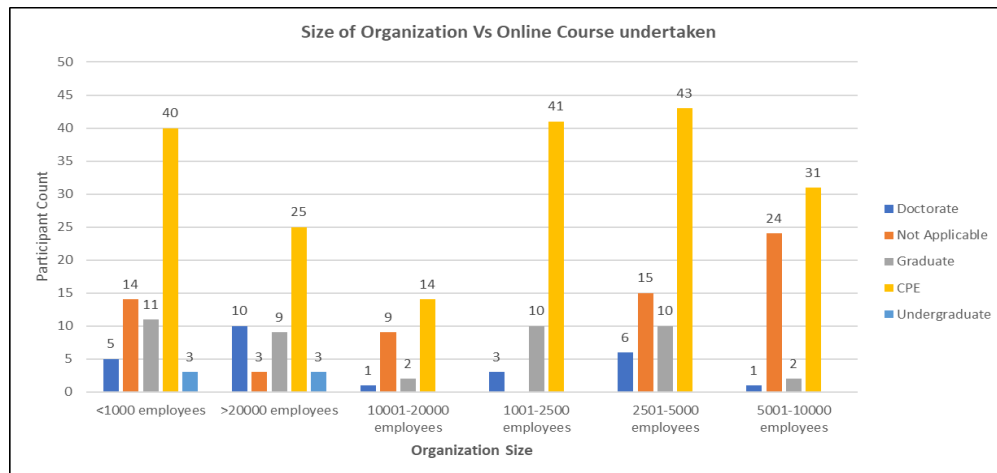
with 1001-2500 employees and very small organizations with <1000 employees. Detail analysis is given in Table 33 and Figure 38 below:

Table 32: Size of organization vs Online course taken

Have you ever taken online course?	Type of Online Course					
Size of Organization	Doctorate	NA (Not Applicable)	Graduate	CPE	Undergraduate	Total
<1000	5	14	11	40	3	73
>20000	10	3	9	25	3	50
10001-20000	1	9	2	14		26
1001-2500	3		10	41		54
2501-5000	6	15	10	43		74
5001-10000	1	24	2	31		58
Total	26	65	44	194	6	335

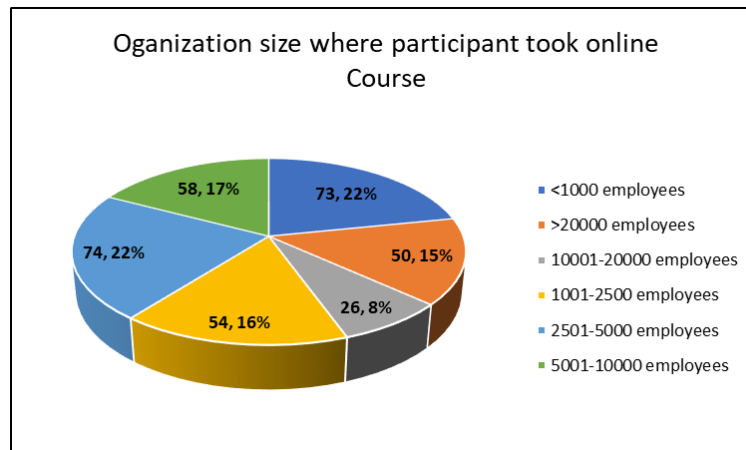
Source: Author's work.

Figure 39: Size of organization vs Online course taken



Source: Author's work.

Figure 40: Organization size distribution where participants took online course

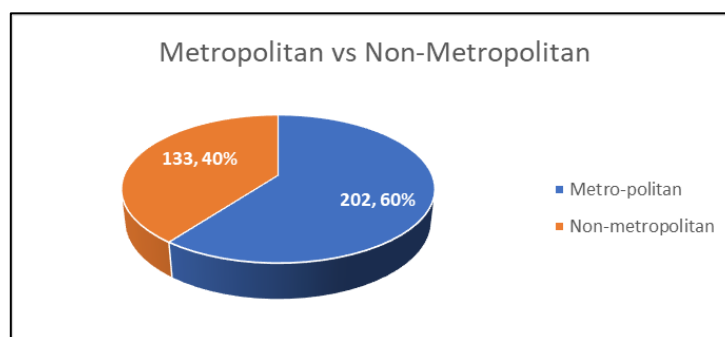


Source: Author's work.

City vs Online Course Taken

Among the 335 survey participants who have taken online course, 60% (202 individuals) were from metro-politan cities, while the remaining 40% (133 individuals) were from non-metro-politan cities.

Figure 41: City wise distribution where participants took online course



Source: Author's work.

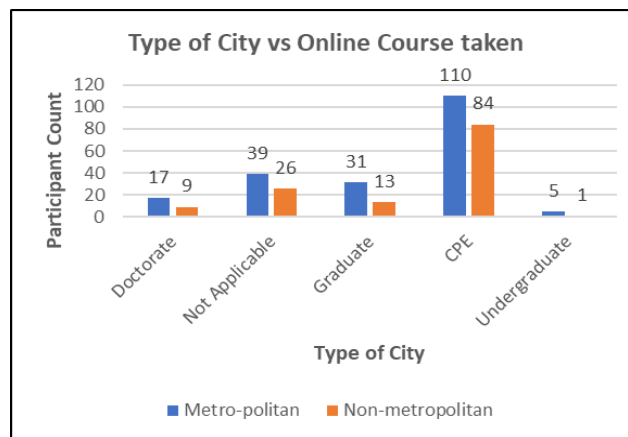
Of the 335 participants, maximum number of course in CPE 33% (110 individuals) was pursued from metropolitan cities, followed by CPE 25% (84 individuals) from non-metropolitan cities, 12% (39 individuals) pursued undisclosed courses from metropolitan cities, whereas 9% did graduate (31 individuals) from metropolitan cities. Doctorate was pursued by 5% (17 individuals) from metropolitan and 3% (9 individuals) from non-metropolitan cities. Analysis of type of cities and courses pursued by participants is given in Table 34 and Figure 41 below:

Table 33: Type of city vs online coursed taken

	Type of Course										
	Doctorate		Not Applicable		Graduate		CPE		Undergraduate		
Type of City	Count	%	Count	%	Count	%	Count	%	Count	%	Total
Metro-politan	17	5%	39	12%	31	9%	110	33%	5	1%	202
Non-metropolitan	9	3%	26	8%	13	4%	84	25%	1	0%	133
Total	26	8%	65	19%	44	13%	194	58%	6	2%	335

Source: Author's work.

Figure 42: Type of city vs online course taken

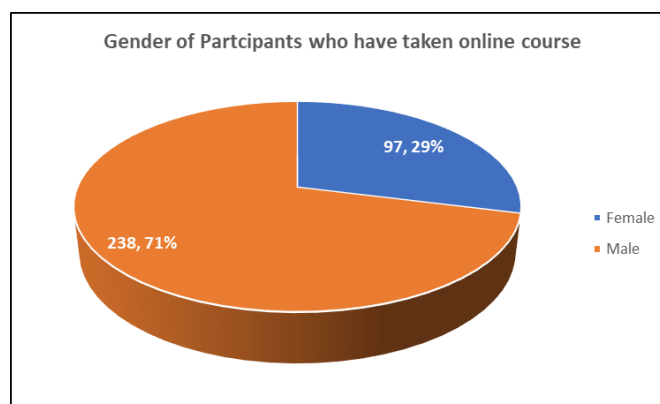


Source: Author's work.

Gender vs Type of Online Course Taken

Among the 335 survey participants who have taken online course, 71% (238 individuals) were male, while the remaining 29% (97 individuals) were female.

Figure 43: Gender Analysis



Source: Author's work.

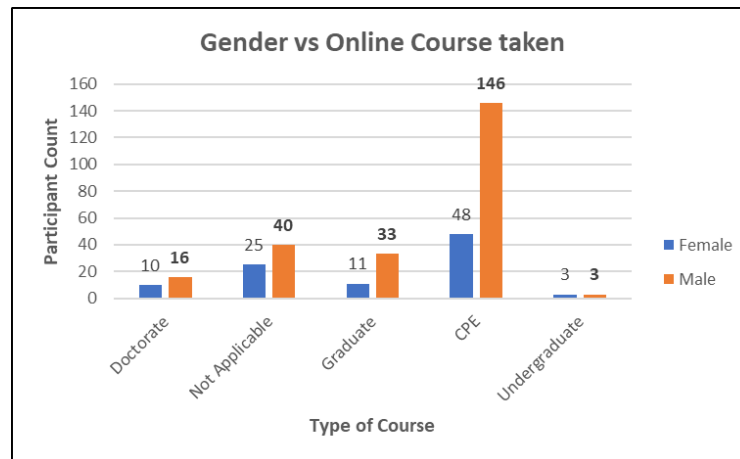
Of the 335 participants, female did maximum number of course in CPE 14% (48 individuals), followed by undisclosed courses 7% (25 individuals), 3% did graduate (11 individuals) and doctorate (10 individuals) while only 1% (3 individuals) pursued undergraduate degree. Male did maximum number of course in CPE 44% (146 individuals), followed by undisclosed courses 12% (40 individuals), 10% did graduate (33 individuals) and 5% did doctorate (16 individuals) while only 1% (3 individuals) pursued undergraduate degree.

Table 34: Gender wise distribution of online course taken

Have you ever taken online course?					
	Female	Female %	Male	Male %	Total
Doctorate	10	3%	16	5%	26
Not Applicable	25	7%	40	12%	65
Graduate	11	3%	33	10%	44
CPE	48	14%	146	44%	194
Undergraduate	3	1%	3	1%	6
Total	97	29%	238	71%	335

Source: Author's work.

Figure 44: Gender vs Online course taken distribution

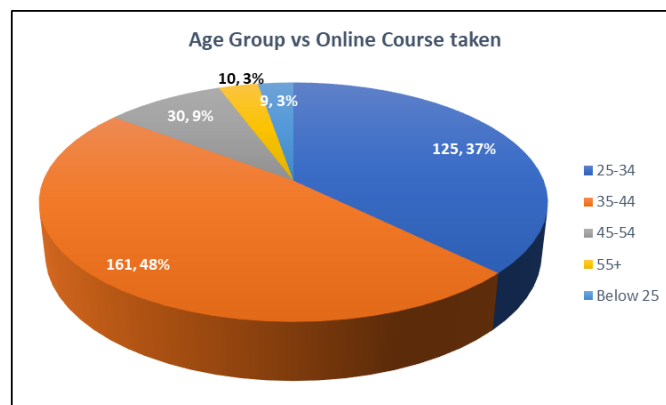


Source: Author's work.

Age Group vs Type of Online Course Taken

Among the 335 survey participants who have taken online course, maximum number 48% (161 individuals) were from 35-44 yrs, followed by 37% (125 individuals) from 25-44 yrs, 9% (30 individuals) were from 45-54 yrs, 3% were from 55+ yrs and below 25%, respectively. Details are given in Figure 44 below:

Figure 45: Age group vs online course taken



Source: Author's work.

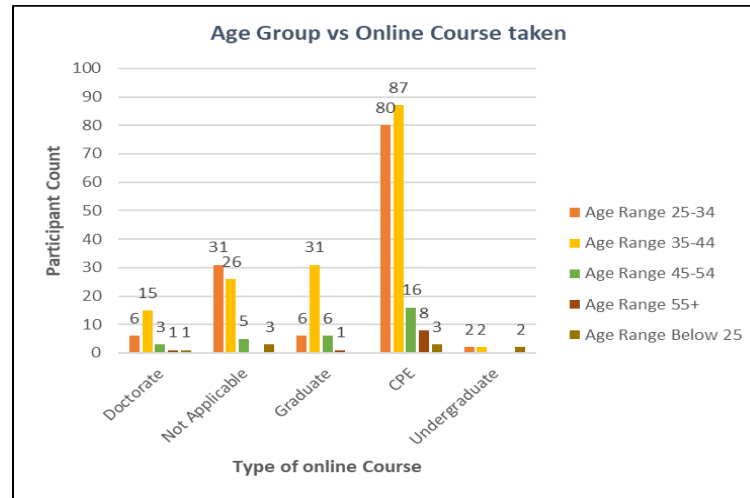
Among the 335 survey participants who have taken online course, maximum number 26% (87 individuals) pursued CPE were from 35-44 yrs, followed by 24% (80 individuals) pursued CPE from 25-44 yrs, 9% (31 individuals) pursued courses that they did not disclose were from 25-34 yrs, 9% (31 individuals) pursued graduate were from 35-44 yrs, 8% (26 individuals) pursued courses that they did not disclose were from 35-44 yrs. Maximum number of doctorate 4% (15 individuals) was pursued in 35-44 yrs. Detailed analysis is given in Table 35 and Figure 46 below:

Table 35: Age group vs type of online course taken

Count of Have you ever taken online course?	25-34		35-44		45-54		55+		Below 25		
Age Range	Count	%	Count	%	Count	%	Count	%	Count	%	Total
Doctorate	6	2%	15	4%	3	1%	1	0%	1	0%	26
Not Applicable	31	9%	26	8%	5	1%		0%	3	1%	65
Graduate	6	2%	31	9%	6	2%	1	0%		0%	44
CPE	80	24%	87	26%	16	5%	8	2%	3	1%	194
Undergraduate	2	1%	2	1%		0%		0%	2	1%	6
Total	125	37%	161	48%	30	9%	10	3%	9	3%	335

Source: Author's work.

Figure 46: Age group vs type of online course taken



Source: Author's work.

Practices around Online Education

The survey initiated with a qualifying question to understand participants' involvement in decision of hiring and/or promotion of employees. Here, "involvement" defined as any of the following options:

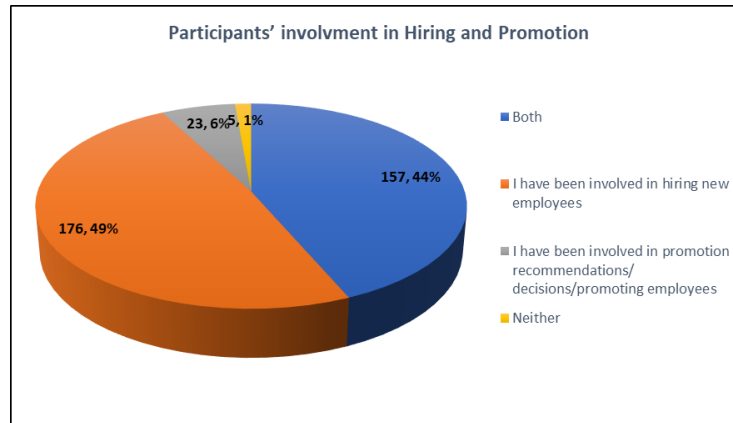
- Screening resumes, and CVs to determine candidate eligibility
- Shortlisting candidates for written tests and interviews
- Conducting interviews
- Evaluating test and interviews
- Making final decisions for hiring
- Recommending employees for promotion
- Making final promotion decisions

Participants' Involvement in Hiring and/or Promotion Decisions of candidates

Among 361 participants, 49% (176) individuals were involved in hiring new employees followed by 44% (157) individuals involved in both hiring and promotion

decisions in their organizations. Another 6% (23) individuals were involved exclusively in promotion decisions whereas, 1% (5) individuals were not involved in either hiring or promotion decisions. Details are given in Figure 47 below:

Figure 47: Participants' involvement in hiring and promotion



Source: Author's work.

Understanding Perception of Online Education Through Policy Related Questions

The survey included a set of questions to understand participants' views on online degrees linked to their organization's policy and practices. These questions aim to analyze how accreditation, rigor, institutional reputation, hierarchy and departments in the organization, and candidates' job-preparedness for the industry influence employers' decision in candidates' assessment and acceptance of online education.

Q1: Do job advertisements in your organization clearly state the required qualifications and selection criteria for professional roles for candidates?

Q2: An online-degree granted by an accredited institution is accepted the same as a traditional, in-person degree when assessing a candidate's educational qualifications during hiring.

Q3: As long as a degree is from accredited institution, the mode of educational institution (traditional, blended, or fully online) is not important.

Q 4: Graduates with fully online degrees programs are as job-ready as graduates from traditional, face-to-face programs.

Q5: Our organization does not consider applicants from online-degree programs.

Q6: In fields like pharmaceuticals, I believe traditional or hybrid degrees better prepare candidates than fully online programs.

Q7: The mix of online vs. traditional courses completed by the candidate to earn their degree holds minimal significance by our organization.

Q8: We feel that online degree programs lack the structure and rigor of traditional programs, potentially affecting the overall credibility of a college degree.

Q9: Do you believe candidates with degree from online universities are ready to meet industry expectations in pharmaceutical jobs (e.g., research, compliance, quality control, etc.)?

Q10: In your opinion, are courses offered by well-known online institutions (such as, IIM, IIT, IGNOU Distance Learning, NMIMS Distance Education, Symbiosis University, Netaji Subhash Open University, Delhi University) equivalent to those offered by traditional four-year college/university programs.

Q11: The reputation of the awarding institution matters more to me than whether the degree was earned online or through in-person classes.

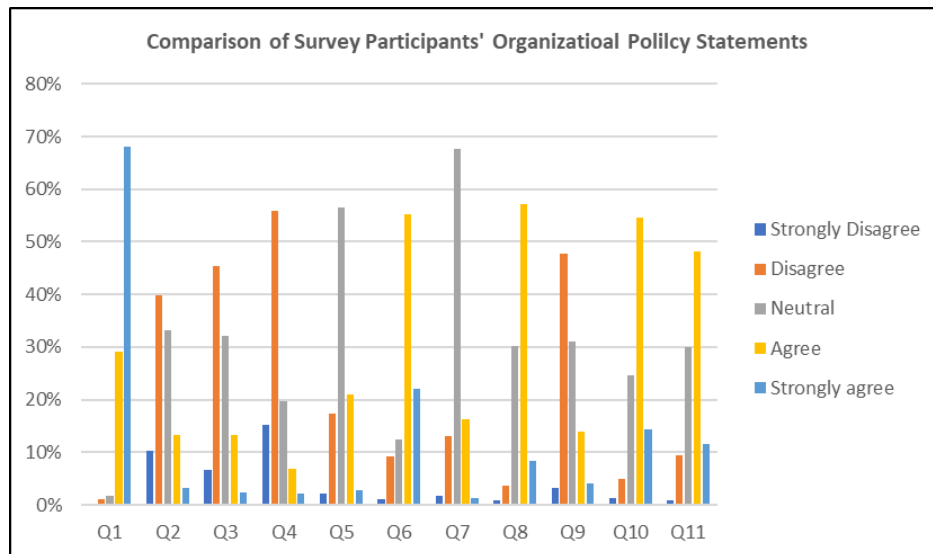
Table 36: Comparison of Survey Participants' Organizational Policy Statements

Q #	Question	Response				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Q1	Do job advertisements in your organization clearly state the required qualifications and selection criteria for professional roles for candidates?	0%	1%	2%	29%	68%
Q2	An online-degree granted by an accredited institution is accepted the same as a traditional, in-person degree when assessing a candidate's educational qualifications during hiring.	10%	40%	33%	13%	3%
Q3	As long as a degree is from accredited institution, the mode of educational institution (traditional, blended, or fully online) is not important.	7%	45%	32%	13%	2%
Q4	Graduates with fully online degrees programs are as job-ready as graduates from traditional, face-to-face programs.	15%	56%	20%	7%	2%
Q5	Our organization does not consider applicants from online-degree programs.	2%	17%	57%	21%	3%
Q6	In fields like pharmaceuticals, I believe traditional or hybrid degrees better prepare candidates than fully online programs.	1%	9%	12%	55%	22%
Q7	The mix of online vs. traditional courses completed by the candidate to earn their degree holds minimal	2%	13%	68%	16%	1%

Q #	Question	Response				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
	significance by our organization.					
Q8	We feel that online degree programs lack the structure and rigor of traditional programs, potentially affecting the overall credibility of a college degree.	1%	4%	30%	57%	8%
Q9	Do you believe candidates with degree from online universities are ready to meet industry expectations in pharmaceutical jobs (e.g., research, compliance, quality control, etc.)?	3%	48%	31%	14%	4%
Q10	In your opinion, are courses offered by well-known online institutions (such as, IIM, IIT, IGNOU Distance Learning, NMIMS Distance Education, Symbiosis University, Netaji Subhash Open University, Delhi University) equivalent to those offered by traditional four-year program.	1%	5%	25%	55%	14%
Q11	The reputation of the awarding institution matters more to me than whether the degree was earned online or through in-person classes.	1%	9%	30%	48%	12%

Source: Author's work.

Figure 48: Comparison of Survey Participants' Organizational Policy Statements



Source: Author's work.

Scenario-based questions for understanding hiring preferences

To examine hiring preferences, the study had three different scenarios, each having two applicants (Applicant A and Applicant B) applying for a single job requirement. Both applicants in each scenario had necessary and required educational qualifications as given in the job description. Participants were asked to evaluate the candidates and tell how likely they would recommend each based on the scale: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Hiring for Freshers

Hiring Scenario 1: Traditional vs Blended

In the first scenario, Applicant A had a degree completed from an accredited university/college with 100% of coursework via traditional classroom and laboratory work, while Applicant B had degree from a college/university where 50% course was

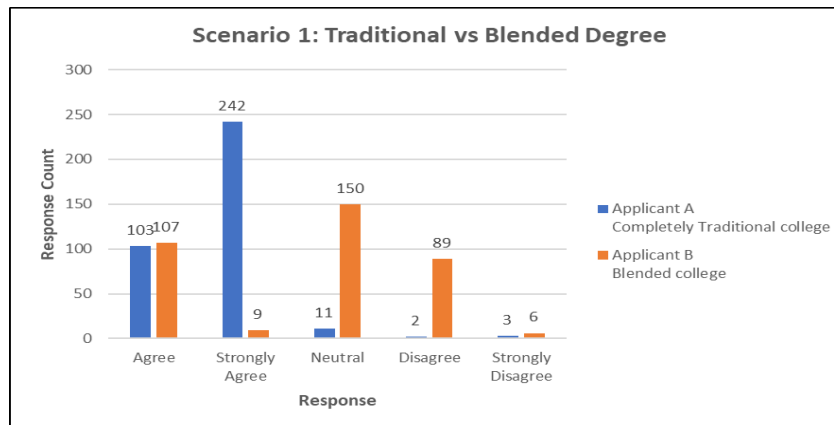
completed via traditional classroom and laboratory work, and 50% coursework was completed online. The study results indicated that out of 361 participants, 96.0% (345/361) agreed or strongly agreed with recommending Applicant A (Completely Traditional college), with only 1% (5/361) disagreeing or strongly disagreeing. For Applicant B (Blended College), 30% (109/361) agreed, 2% (9/361) strongly agreed, 42% (150/361) were neutral, whereas 25% (89/361) disagreed and 2% (6/361) strongly agreed. The findings showed clear preference for degrees from traditional college with 96% (345/361) preferring them compared to 32% (116/361) for blended degree. Around 26% (95/361) did not prefer blended degrees and only 1% (5/361) did not prefer traditional degree. Details are given in Table 38 and Figure 48 below:

Table 37: Fresher Hiring - Traditional vs Blended

Fresher Hiring				
Scenario 1: Traditional vs Blended Degree				
	Applicant A Completely Traditional college		Applicant B Blended college	
Response	Count	%	Count	%
Agree	103	29%	107	30%
Strongly Agree	242	67%	9	2%
Neutral	11	3%	150	42%
Disagree	2	1%	89	25%
Strongly Disagree	3	1%	6	2%
Total	361		361	

Source: Author's work.

Figure 49: Fresher Hiring - Traditional vs Blended



Source: Author's work.

Hiring Scenario 2: Degree from Traditional vs Fully Online college

In the second scenario, Applicant A had a degree completed from an accredited university/college with 100% of coursework via traditional classroom and laboratory work, while Applicant B had degree from a college/university that does not have a physical campus, classrooms, libraries or laboratories and 100% course was completed via online. The study results of 361 participants indicated that 97.0% (349/361) agreed or strongly agreed with recommending Applicant A (Completely Traditional college), 2% (9/361) were neutral, whereas only 1% (2/361) disagreeing or strongly disagreeing. For Applicant B (100% Online College) out of 361 participants, only 7% (25/361) agreed, 1% (5/361) strongly agreed, 23% (150/361) were neutral, whereas 58% (209/361) disagreed and 11% (39/361) strongly agreed. The findings showed clear preference for degrees from traditional college with 97% (349/361) preferring them compared to only 8% (30/361) for 100% online degree. Notably 69% (248/361) did not prefer online

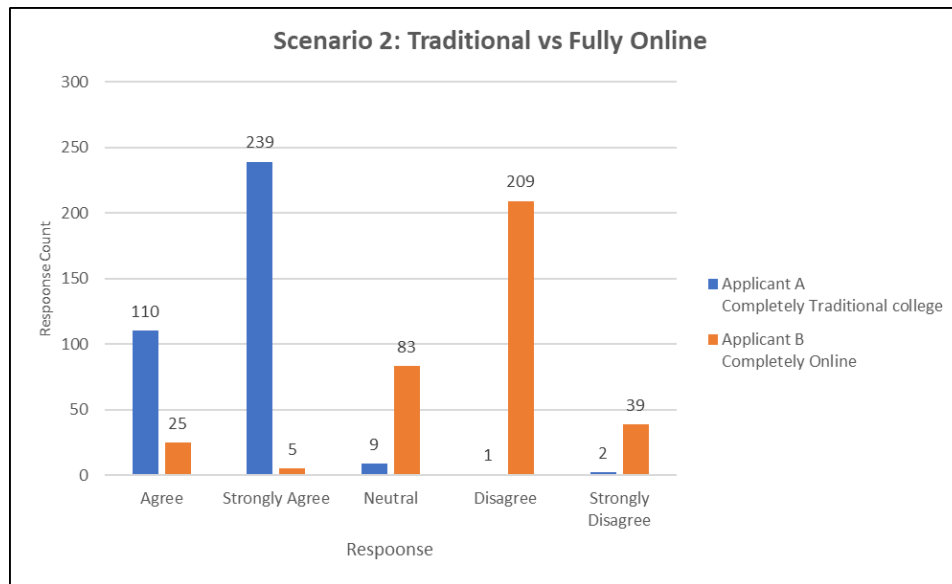
degrees and only 1% (3/361) did not prefer traditional degree. Details are given in Table 38 and Figure 50 below:

Table 38: Traditional vs Fully Online college

Fresher Hiring				
Scenario 2: Traditional vs Fully Online College				
	Applicant A Completely Traditional college		Applicant B Completely Online college	
Response	Count	%	Count	%
Agree	110	30%	25	7%
Strongly Agree	239	66%	5	1%
Neutral	9	2%	83	23%
Disagree	1	0%	209	58%
Strongly Disagree	2	1%	39	11%
Total	361		361	100%

Source: Author's work.

Figure 50: Traditional vs Fully Online college



Source: Author's work.

Hiring Scenario 3: Degree from Blended vs Fully Online college

In the third scenario, Applicant A had degree from a college/university where 50% course was completed via traditional classroom and laboratory work, and 50% coursework was completed online, while Applicant B had degree from a college/university that does not have a physical campus, classrooms, libraries or laboratories and 100% course was completed via online. The study results of 361 participants indicated that for Applicant A (Blended), 36% (130/361) agreed, 9% (33/361) strongly agreed, and 42% (152/361) were neutral. 13% (46/361) were disagreed to prefer Applicant A. For Applicant B (100% Online College) out of 361 participants, only 7% (24/361) agreed, 2% (7/361) strongly agreed, 30% (109/361) were neutral, whereas 52% (189/361) disagreed and 9% (32/361) strongly agreed. The findings showed clear preference for degrees from Blended college with 45% (163/361) preferring them,

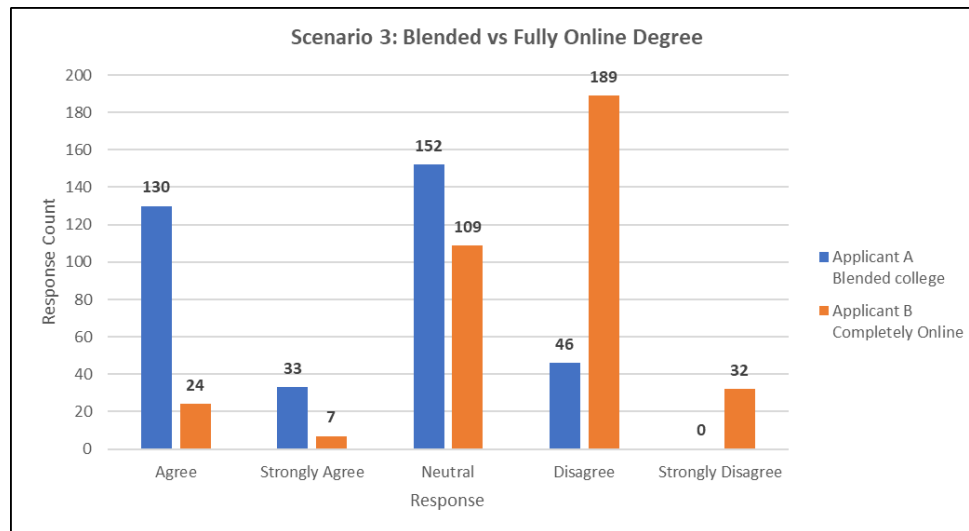
42% (152/361) neither agreeing nor disagreeing compared to only 9% (31/361) for 100% online degree. Notably 61% (221/361 participants) did not prefer online degrees and only 13% (46/361) did not prefer blended degree. Details are given in Table 39 and Figure 51 below:

Table 39: Blended vs Fully Online

Fresher Hiring Scenario 3: Blended vs Fully Online Degree				
	Applicant A Blended college		Applicant B Completely Online	
Response	Count	%	Count	%
Agree	130	36%	24	7%
Strongly Agree	33	9%	7	2%
Neutral	152	42%	109	30%
Disagree	46	13%	189	52%
Strongly Disagree	0	0%	32	9%
Total	361		361	

Source: Author's work.

Figure 51: Blended vs Fully Online



Source: Author's work.

Hiring for Experienced

Hiring Scenario 1: Traditional vs Blended

In the first scenario, Applicant A had degree from a fully traditional college, while Applicant B had degree from blended mode (50% traditional and 50% online). For Applicant A, out of 361 participants, 53% (191/361) agreed, 26% (95/361) strongly agreed and 20% (73/261) were neutral. Only 1% (2/361) did not recommended Applicant A. For Applicant B, 48% (172/361) agreed/strongly agreed, 50% (180) remained neutral, and only 2% (9/361) did not prefer the blended degree.

The findings showed clear preference for degrees from traditional college with 79% (286/361) preferring them compared to 48% (172/361) for blended degree. The participants not preferring traditional and blended degrees were almost equal 1% (2/361) and 2% (9/361), respectively. However, 50% (180/361) were neutral for hiring experienced employees with blended degrees. This shows a clear preference of increasing

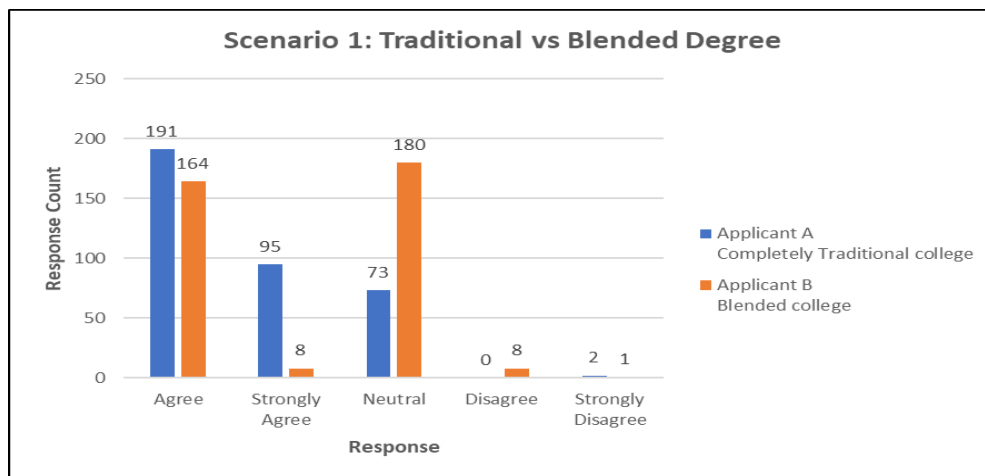
trends of acceptance of degrees through blended mode. Detailed analysis is given in Table 40 and Figure 52 below:

Table 40: Experienced Hiring - Traditional vs Blended

Experienced Hiring Scenario 1: Traditional vs Blended Degree				
	Applicant A Traditional college		Applicant B Blended college	
Response	Count	%	Count	%
Agree	191	53%	164	45%
Strongly Agree	95	26%	8	2%
Neutral	73	20%	180	50%
Disagree	0	0%	8	2%
Strongly Disagree	2	1%	1	0%
Total	361		361	

Source: Author's work.

Figure 52: Experienced Hiring - Traditional vs Blended



Source: Author's work.

Experienced Hiring Scenario 2: Degree from Traditional vs Fully Online college

In the second scenario, Applicant A had degree from a fully traditional college, while Applicant B had degree from fully online college/university which has no physical campus. Out of 361 participants, 80% (287/361) preferred favored Applicant A, 20% (71/361) were neutral and only 1% (3/361) indicated disagreement. For Applicant B, out of 361, 28% (102/361) agreed, 63% (228/361) were neutral i.e., neither agreeing nor disagreeing and only 8% (31/361) did not prefer online degrees.

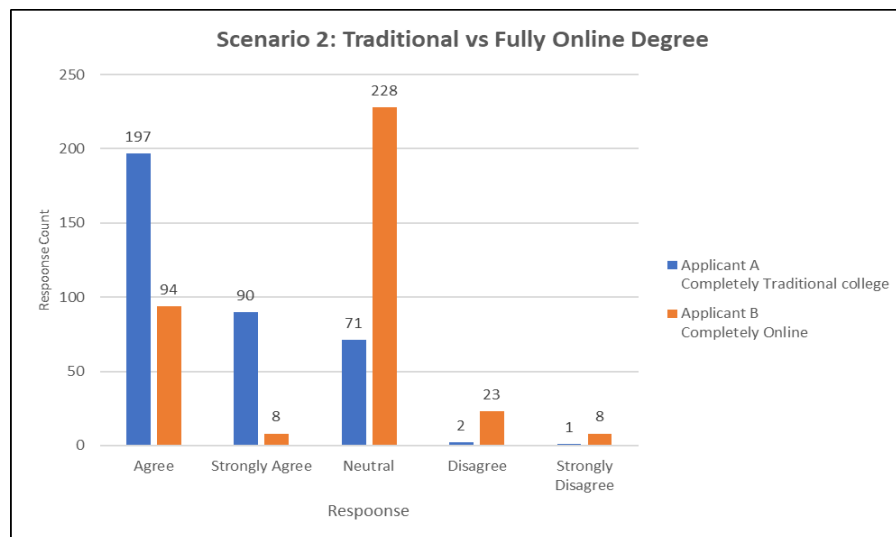
The findings showed clear preference for traditional degrees with 80% (287/361) preferring them compared to 28% (102/361) for online degree. Only 1% (3/361) did not prefer traditional degrees and 9% (31/361) did not prefer online degree. However, 63% (228/361) were neutral for hiring experienced employees with online degrees showing increasing trends of acceptance of degrees through online mode as well. Details are given in Table 41 and Figure 53 below:

Table 41: Experienced Hiring: Traditional vs Fully Online college

Experienced Hiring Scenario 2: Traditional vs Fully Online College				
	Applicant A Traditional college		Applicant B Online	
Response	Count	%	Count	%
Agree	197	55%	94	26%
Strongly Agree	90	25%	8	2%
Neutral	71	20%	228	63%
Disagree	2	1%	23	6%
Strongly Disagree	1	0%	8	2%
Total	361		361	100%

Source: Author's work.

Figure 53: Experienced Hiring: Traditional vs Fully Online college



Source: Author's work.

Hiring Scenario 3: Degree from Blended vs Fully Online college

In the third scenario, Applicant A had degree from blended mode (50% traditional and 50% online), while Applicant B had degree from fully online college/university which has no physical campus. Out of 361 participants, 51% (185/361) preferred favored Applicant A, 48% (174/361) were neutral and only 1% (2/361) indicated disagreement. For Applicant B, out of 361, 27% (98/361) agreed, 61% (222/361) were neutral i.e. neither agreeing nor disagreeing and 11% (41/361) did not prefer online degrees.

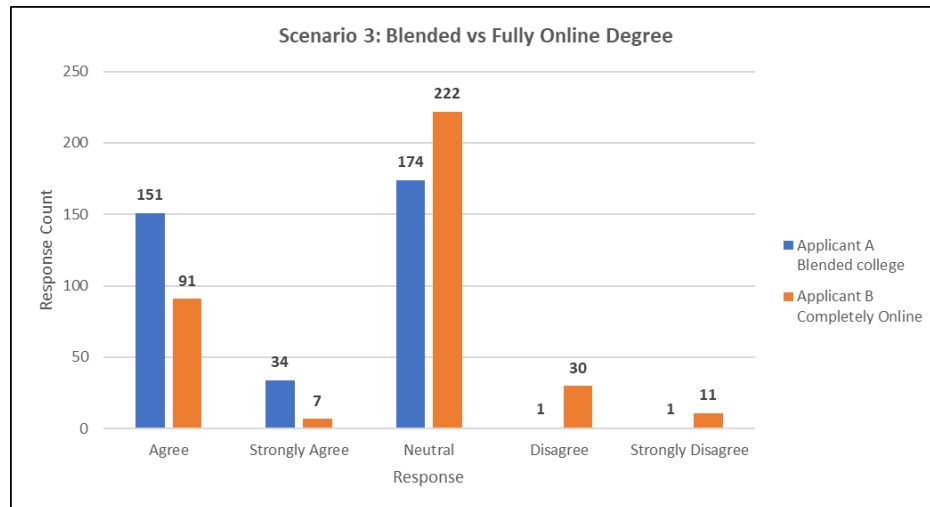
The findings showed marginal preference for blended degrees, with 51% (185/361) preferring them compared to 27% (98/361) for online degree. Only 1% (2/361) did not prefer blended degrees and 11% (41/361) did not prefer online degree. However, 61% (222/361) were neutral for hiring experienced employees with online degrees showing increasing trends of acceptance of degrees through online mode as well. Details are given in Table 42 and Figure 54 below:

Table 42: Experienced Hiring: Blended vs Fully Online

Experienced Hiring Scenario 3: Blended vs Fully Online Degree				
	Applicant A Blended college		Applicant B Completely Online	
Response	Count	%	Count	%
Agree	151	42%	91	25%
Strongly Agree	34	9%	7	2%
Neutral	174	48%	222	61%
Disagree	1	0%	30	8%
Strongly Disagree	1	0%	11	3%
Total	361		361	

Source: Author's work.

Figure 54: Experienced Hiring: Blended vs Fully Online



Source: Author's work.

Promotion

Promotion Scenario 1: Traditional vs Blended

In the first scenario, Applicant A had degree from a fully traditional college, while Applicant B had degree from blended mode (50% traditional and 50% online). For Applicant A, out of 361 participants, 50% (179/361) agreed, 20% (72/361) strongly agreed and 30% (108/361) were neutral. Only 1% (2/361) did not recommended Applicant A. For Applicant B, 46% (149/361) agreed/strongly agreed, 53% (190) remained neutral, and only 2% (6/361) did not prefer the blended degree.

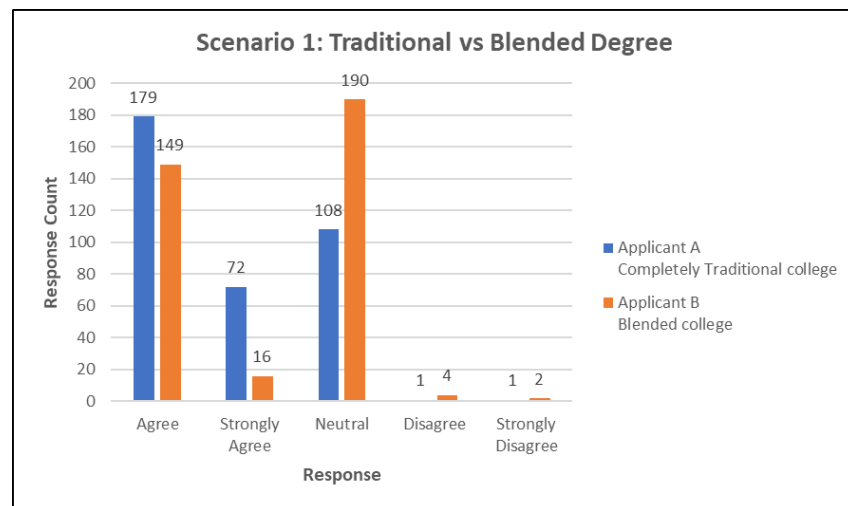
The findings showed clear preference for degrees from traditional college with 70% (251/361) preferring them compared to 46% (149/361) for blended degree. The participants not preferring traditional and blended degrees were almost equal 1% (2/361) and 2% (6/361), respectively. However, 53% (190/361) were neutral for promoting employees with blended degrees. This shows a clear preference of increasing acceptance of degrees through blended mode. Details are given in Table 44 and Figure 54 below:

Table 43: Promotion - Traditional vs Blended

Promotion				
Scenario 1: Traditional vs Blended Degree				
	Applicant A Complete Traditional college		Applicant B Blended college	
Response	Count	%	Count	%
Agree	179	50%	149	41%
Strongly Agree	72	20%	16	4%
Neutral	108	30%	190	53%
Disagree	1	0%	4	1%
Strongly Disagree	1	0%	2	1%
Total	361		361	

Source: Author's work.

Figure 55: Promotion - Traditional vs Blended



Source: Author's work.

Promotion Scenario 2: Degree from Traditional vs Fully Online college

In the second scenario, Applicant A had degree from a fully traditional college, while Applicant B had degree from fully online college/university which has no physical campus. Out of 361 participants, 67% (242/361) preferred favored Applicant A, 32% (116/361) were neutral and only 1% (3/361) indicated disagreement. For Applicant B, out of 361, 31% (111/361) agreed, 64% (230/361) were neutral i.e. neither agreeing nor disagreeing and only 6% (20/361) did not prefer online degrees.

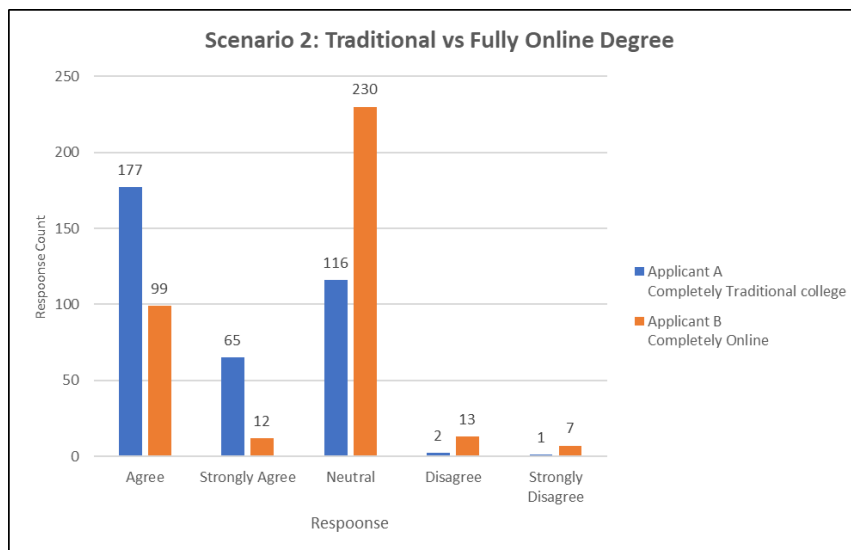
The findings showed preference for degrees from traditional colleges, with 67% (287/361) preferring them compared to 32% (102/361) for online degree. Only 1% (3/361) did not prefer traditional degrees and 6% (20/361) did not prefer online degree. However, 64% (230/361) were neutral for promoting employees with online degrees showing increasing trend of acceptance of degrees through online education. Detailed analysis is given in Table 44 and Figure 56 below:

Table 44: Promotion: Traditional vs Fully Online college

Promotion				
Scenario 2: Traditional vs Fully Online College				
	Applicant A Completely Traditional college		Applicant B Completely Online	
Response	Count	%	Count	%
Agree	177	49%	99	27%
Strongly Agree	65	18%	12	3%
Neutral	116	32%	230	64%
Disagree	2	1%	13	4%
Strongly Disagree	1	0%	7	2%
Total	361		361	

Source: Author's work.

Figure 56: Promotion: Traditional vs Fully Online college



Source: Author's work.

Promotion Scenario 3: Degree from Blended vs Fully Online college

In the third scenario, Applicant A had degree from blended mode (50% traditional and 50% online), while Applicant B had degree from fully online college/university which has no physical campus. Out of 361 participants, 51% (184/361) preferred favored Applicant A, 47% (171/361) were neutral and only 2% (6/361) indicated disagreement. For Applicant B, out of 361, 29% (103/361) agreed, 65% (236/361) were neutral i.e., neither agreeing nor disagreeing and 6% (22/361) did not prefer online degrees.

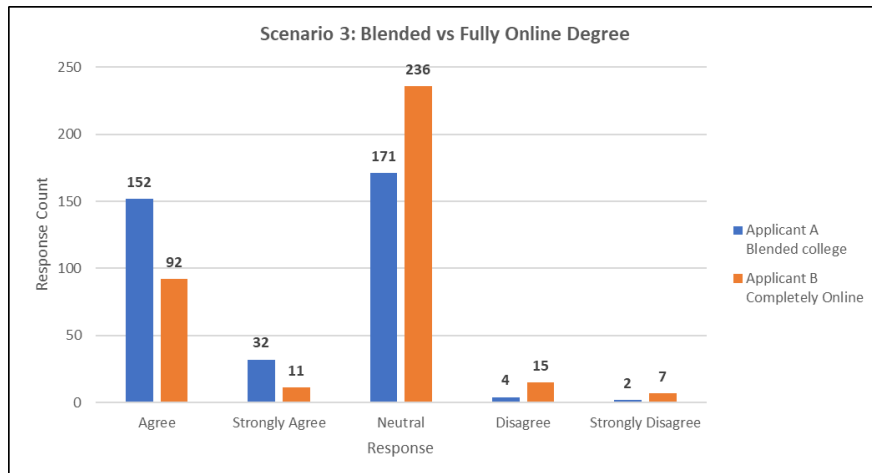
The findings showed marginal preference for blended degrees, with 51% (184/361) preferring them compared to 47% (171/361) for online degree. Only 2% (6/361) did not prefer blended degrees and 6% (41/361) did not prefer online degree. However, 65% (236/361) were neutral for promoting employees with online degrees suggesting an increasing acceptance of online degrees. Details are given in Table 45 and Figure 57 below:

Table 45: Promotion: Blended vs Fully Online

Promotion				
Scenario 3: Blended vs Fully Online Degree				
	Applicant A Blended college		Applicant B Completely Online	
Response	Count	%	Count	%
Agree	152	42%	92	25%
Strongly Agree	32	9%	11	3%
Neutral	171	47%	236	65%
Disagree	4	1%	15	4%
Strongly Disagree	2	1%	7	2%
Total	361		361	

Source: Author's work.

Figure 57: Promotion: Blended vs Fully Online



Source: Author's work.

4.1.3 Research Hypothesis Analysis

The following section provides the analysis of hypothesis developed for the study to understand the perception of Indian pharmaceutical employers towards accepting online degrees.

H01: There is no significant difference in Indian pharmaceutical employers' willingness to accept online degrees during hiring and promotion decisions across different level of equivalency perception of online degrees with regular degrees.

H11: There is significant difference in Indian pharmaceutical employers' willingness to accept online degrees during hiring and promotion decisions across different level of equivalency perception of online degrees with regular degrees.

- Three groups with 11 participants in each group. Based on their response the groups were divided in Low, Medium and High Perception.
- ANOVA test is performed.
- Here, $p=0.002$ ($p<0.05$). So, Null hypothesis (H01) is rejected and alternate hypothesis: the willingness to accept online degree during hiring and promotion decisions depends on the perception of the online degree by pharmaceutical employers in India, is accepted.

Figure 58: Hypothesis H11

SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Group 1 Low Perception	11	31	2.818	1.364		
Group 2 Medium Perception	11	44	4.000	0.400		
Group 3 High Perception	11	50	4.545	0.473		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	17.152	2	8.576	11.504	0.0002	3.316
Within Groups	22.364	30	0.745			
Total	39.515	32				

Source: Author's work.

- There is a significant difference in acceptance as per perception of online degrees (F=11.504).
- Results indicate that employers with higher perception of Online Degrees equivalent as regular degrees are more willing to hire or promote candidates with online degrees.

H02: The accreditation status of program, reputation of the institution and industry relevance does not impact the decision of employers.

H12: Indian Pharmaceutical employers are more inclined to accept online degrees when the programs are accredited, from reputed institutions and industry specific.

- Four groups with 33 participants in each group with options to select Candidates with Accredited, Reputed, Industry Specific courses, accredited only, reputed only and None (Not accredited, Reputed, Industry specific).
- ANOVA test is performed.

- Here, $p=0.001$ ($p<0.05$). So, Null hypothesis (H02) is rejected and alternate hypothesis: Indian Pharmaceutical employers are more inclined to accept online degrees when the programs are accredited, from reputed institutions and industry specific, is accepted.

Figure 59: Hypothesis H12

SUMMARY					
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Accredited, Reputed, Industry Specific	33	136	4.121	0.547	
Only Accredited	33	89	2.697	0.405	
Only Reputed	33	78	2.364	0.239	
None	33	44	1.333	0.292	
ANOVA					
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i> <i>F crit</i>
Between Groups	131.356	3	43.785	118.103	0.001 2.675
Within Groups	47.455	128	0.371		
Total	178.811	131			

Source: Author's work.

- Results indicate that employers are more willing to accept online degrees when they are from accredited and reputed institutions with industry-specific programs.

H03: There is no difference in the perception of pharmaceutical employers towards online degrees while hiring or promotion decisions for across departments such as core departments (e.g. R&D, Manufacturing, Clinical Trials, and Audit), support departments (e.g. HR, Admin, Finance), both core and support and not fit for any department.

H13: There is a significant difference in the perception of pharmaceutical employers towards online degrees while hiring or promotion decisions for across departments such as core departments (e.g. R&D, Manufacturing, Clinical Trials, and Audit), support

departments (e.g. HR, Admin, Finance), both core and support and not fit for any department.

- Four groups with 33 participants in each group with options to select Candidates with Core Departments (R&D, Manufacturing, Clinical Trials, Audit), Support Departments (HR, Admin, Finance, IT), Both (Core and Support), and Not suitable for any department.
- ANOVA test is performed.
- Here, $p=0.001$ ($p<0.05$). So, Null hypothesis (H_0) is rejected and alternate hypothesis: There is a significant difference in the perception of pharmaceutical employers towards online degrees while hiring or promotion decisions for across departments such as core departments (e.g. R&D, Manufacturing, Clinical Trials, and Audit), support departments (e.g. HR, Admin, Finance), both core and support and not fit for any department, is accepted.

Figure 60: Hypothesis H13

SUMMARY						
Groups	Count	Sum	Average	Variance		
Core Departments (R&D, Manufacturing, Clinical Trials, Audit)	33	48	1.455	0.381		
Support Departments (HR, Admin, Finance, IT)	33	92	2.788	0.797		
Both (Core and Support)	33	75	2.273	0.267		
Not suitable for any department	33	80	2.424	0.877		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	31.417	3	10.472	18.040	0.001	2.675
Within Groups	74.303	128	0.580			
Total	105.720	131				

Source: Author's work.

- Results indicate that employers' perception towards online degrees significantly varies across different departments. The mean score suggest that Indian Pharmaceutical employers are more willing to accept candidates with online degrees in support departments than core pharmaceutical departments.

4.2 Research Findings II – Thematic Analysis

This section captures the thematic analysis of qualitative insights in addition to the quantitative and exploratory results from interviews and surveys. Data from open ended interview and semi-structured survey questions on acceptability of online degrees in Indian Pharmaceutical Industry were investigated to identify leading trends. Together, these themes respond to the core research questions by exploring how Indian Pharmaceutical Industry perceives the online degrees at under-graduate, graduate and post-graduate levels during hiring and promotion decisions. Emerging trends are discussed under following sub-sections:

- 1) Perceived Barriers to Online Education
- 2) Constraints in Learner Capabilities
- 3) Industry Relevance of Online Education
- 4) Policy Framework for Online Degrees
- 5) Evolving Positive Views on Online Education

4.2.1 Perceived Barriers to Online Education

Following themes emerged from the data related to perceived barriers to online education:

- 1) Strong preference for traditional degrees
- 2) Low acceptance in technical and clinical domains
- 3) Perceived lack of quality, rigor, and discipline
- 4) Insufficient practical and industry exposure
- 5) Labor market saturation in India
- 6) Institutional and organizational bias

- 7) Limited credibility of online institutions
- 8) Online degrees seen as low career value
- 9) More suitable for working professionals than freshers
- 10) Concerns regarding credibility of Evaluation Process
- 11) Limitations of Quality of online Faculty

4.2.1.1 Strong preference for traditional degrees

Participants stated that online degrees are not equal to face-to-face education. Below statements by employers indicate their strong bias towards traditional education as they perceive online degrees as less credible, lack quality and focus.

- *“I will be biased towards traditional degrees.”*
- *“Regular courses are more disciplined, rigorous and credible in corporate world.”*
- *“People who could not get admission in regular college go for online.”*
- *“It has less value. Seems learnt from WhatsApp, Google.”*
- *“Not interactive, not focused, no collaboration between faculty and students. Works in isolation, boring. I will prefer classroom-mode.”*
- *“People doing online courses even from most premier institutes lack in-depth knowledge of the subject.”*
- *“Unless you have done course from any premier institute degree till graduation level matters only.”*

Employers feel that online degree holders do not respect experience, workplace values and merit. They emphasized that young professionals from reputed institute

without real-time industry experience devalue experienced employees who invested years towards growth and revenue generation for the organization:

- *“People with 24-25 years of age from premier institute who do not have any practical or industry experience they just come and tell us how to work on MS PowerPoint, or generate prescription who gave their 20-30 years for the organization and actually generating revenue. This is not good.”*
- *“I will reject person even if from IIT or IIM through online.”*

4.2.1.2 Low acceptance in technical and clinical domains

Participants felt that online degree holders are suitable primarily for support roles such as HR, Sales, Marketing and so on.

- *“Online is effective only in administrative and not in technical departments like drug development.”*
- *“It is ok for digital and data research but not for clinical research.”*
- *“Only administration and support departments like HR.”*
- *“Support and elementary departments like sales, accounts, HR, marketing, sales”*

Above statements indicated the specialized departments such as drug research and development, manufacturing, clinical trials need hands-on practical experience. However, some participants felt that online education can be beneficial as an additional qualification from reputed institute if they have college level degree from regular college: *“These are good for Sales, admin, R&D if addendum technical online course done from good institute”*.

4.2.1.3 Organizational Bias

Responses from participants indicate that many Indian Pharmaceutical companies lack formal policies to hire online graduates.

- *“No Organizational policy to hire online degree holders.”*
- *“Organization still prefer hiring candidates from traditional institute for fresher level/core pharma job.”*
- *“No use of doing online courses as companies do not give any importance to them and do not hire them.”*
- *“Traditional degree is more valuable, get to connect with mentor, hands-on experience.”*

Employers prefer to hire graduates from traditional colleges especially for technical, core-pharma related roles and at entry level roles as they offer regular interaction and practical knowledge.

4.2.1.4 Insufficient Practical and Industry Exposure

Online education is an effective way to provide theoretical knowledge however it lacks in providing practical and hand-on experience. It poses a big hindrance in its acceptability in Pharmaceutical Industry where lab exposure and instrument handling is required. Some respondents articulated:

- *“I do not know if any college in India offers online degree for Science subjects or technical subjects as they require practical, lab exposure and equipment handling.”*
- *“Online programs are not worth as they do not give practical exposure.”*

- *“Not interested in any online course as they are useless and do not provide practical.”*
- *“Practical knowledge is required in almost all the departments.”*

4.2.1.5 Labor Market Saturation in India

Indian labor market is highly saturated due to large supplies of graduates from regular colleges competing for limited jobs available. Due to this, employers in the Pharmaceutical Industry which is a niche area show reluctance in hiring candidates with online education. Few participants indicated:

- *“In India, so many candidates with regular colleges are available there is no point taking online candidates.”*
- *“In India, degree is not that important as unemployment is too high.”*
- *“Unless you have done course from any premier institute degree till graduation level matters only.”*

Above statements show that acceptability of online education is adversely impacted due to high unemployment rate in India. Employers prefer hiring candidates from traditional colleges as they are adequately available unless the candidate has online degree from premier institutes.

4.2.1.6 More Suitable for Working Professionals Than Freshers

A majority of participants reported online learning is beneficial for experienced people after foundational education, significant experience and industry exposure. Whereas freshers in pharmaceutical industry need to get sufficient knowledge, hands-on

experience, and mentoring from faculty that is provided in traditional college.

Participants articulated:

- *“For freshers, online is not good as this is not immersive, lacks focus and interaction with teachers and students.”*
- *“It is beneficial after significant experience in the industry and certain level in career, then only online education helps.”*
- *“Graduation, post-graduation degree from regular college is must.”*

These statements indicate that there is still trust deficit for online education and it may not fulfill educational requirements at undergraduate level where discipline and quality education is must.

4.2.1.7 Concerns Regarding Quality of Education and Faculty

Participants expressed that the overall quality of online education is lower than face to face learning due to lacks interaction with faculty, peer interaction, team work and questionable quality of the faculty. Some participants noted:

- *“Mode of education should only be offline especially in science related industries.”*
- *“Online education cannot replace formal, traditional education.”*
- *“Quality is compromised in online learning.”*
- *“Regular courses are more disciplined, rigorous and credible in corporate world.”*
- *“Institutes are only making money and giving degrees.”*

- *“Teachers in institutes are inefficient, not properly trained and do not focus on students.”*
- *“There are no transparent criteria for the monitoring of faculty performance and their education quality.”*

4.2.1.8 Concerns regarding credibility of Evaluation Process

Participants reported concerns about fairness of the examination process in online education. Several participants said that online examination process lacks proper monitoring and due to this it is very difficult to judge the real talent, knowledge and competency of a candidate. Few participants stated:

- *“Not authentic. Institutes also give question paper and assignments before exams.”*
- *“Examination process is not transparent and credible.”*
- *“Assignments are not checked rigorously or given any importance. Students do it just for sake of number. Sometimes assignments are also shared by faculty to the students.”*
- *“People are not even able to tell what assignments they have done during course.”*

Above statements also show that candidates are unable to show-case the project work done during their online learning as they did not put required efforts in the assignments.

4.2.2 Constraints in Learner Capabilities

Six themes emerged from the data related to limitations of online education:

4.2.2.1 Lack of learner's motivation and focus

Participants reported that many times students doing online education lack motivation and are not focused. It happens as they do not have to show up in a regular class face to face. Some participants stated:

- *“Candidates are not serious about courses and lack practical skill and implementation.”*
- *“They treat classes casually, are not serious as in traditional college where they have to formally dress up and appear in the class.”*
- *“They do not take classes or assignment seriously at all.”*

This ultimately leads to candidates having lack of practical knowledge and lack of commitment towards education and work.

4.2.2.2 Skill and Attitude of Learner

Participants expressed that online learner have casual attitude and lack necessary skills. They told:

- *“Online learners lack knowledge and skill, not serious and disciplined”*
- *“Not serious, people are taking classes from cafes, and other non-serious places.”*
- *“Only focused on completing the course anyhow and get the certificate instead of aiming to earn knowledge.”*

- *“They do not have any people management, problem solving skills and group work as they work in isolation.”*

Attending online classes often results in missing seriousness and low discipline. Employers feel candidates with online education do not have problem solving skills or collaborative approach.

4.2.2.3 Individual Competency valued more than mode of education

Results showed that employers value individual’s capabilities over the mode of education while making hiring and promotion decisions. Participants expressed that individual’s knowledge, attitude, skill and communication skills are the actual employment necessities. Respondents stated:

- *“Degrees are not important. Skill, knowledge, attitude, communication matters.”*
- *“Individual’s effort and knowledge defines the employability.”*
- *“People do online MBA only for promotion.”*
- *“While assessing an individual we only value what competency and value the individual can add to the organization. Mode of education is irrelevant.”*
- *“For me skill, talent and industrial experience is most valued.”*

4.2.2.4 Industrial Experience outweigh mode of education

Participants expressed that industrial experience matters more than whether the education is online or offline. They believed that degrees are vital only at the initial years or for freshers out from college, but for experienced profiles industrial experience is important. Few participants responded:

- *“Will judge only on base of performance, outcomes irrespective of college, mode of education.”*
- *“Practical knowledge is required in almost all the departments.”*
- *“Degrees can help you only in getting job in starting of your career after that industrial experience is valued more.”*
- *“Also, people with online education only do not have any work experience.”*
- *“Employers should not have prejudice; they should judge the candidate knowledge and then make the decision.”*
- *“Creativity, original ideas do not just rely on degree or college”*

4.2.2.5 Job Performance and Knowledge implementation

Results indicated that participants believe that in most cases online education does not translates into job performance. It only provides theoretical knowledge and fails to give practical exposure which is required in highly regulated pharmaceutical industry. Few participants expressed:

- *“People doing online courses even from most premier institutes lack in-depth knowledge of the subject.”*
- *“If people can implement what they learned during their course, then online is fine. But in most of the cases it does not happen.”*
- *“People do expensive courses from online institutes but fail to demonstrate in their working environment. It raises doubts.”*

They concluded online education will be beneficial only when the learners will showcase their knowledge in solving real industrial problems.

4.2.2.6 Financial and Institutional Constraints

Results showed that participants decisions to pursue online course depends on financial support and type of courses. Several participants said that they would do only short time online course or do only if sponsored by their organization. Few did not find any motivation, any immediate benefits, lack patience or have financial constraints to enroll in online course. Some participants stated:

- *“I will do any short and crisp course only if sponsored by my company.”*
- *“I am reluctant to do any online course as I do not have patience.”*
- *“I will go for only for short time online course instead of going for any long-term courses as market requirements are changing.”*
- *“I will prefer short term certification but not online degree.”*

It shows in absence of financial support from organization, employees are reluctant to go for online courses as market requirements are changing rapidly.

4.2.3 Increasing Industrial Relevance of Online Education

Following themes emerged from the data related to Industry relevance of online education:

4.2.3.1 Offers updated, industry-relevant curriculum

Post covid industrial acceptance of online education got traction because they offer courses and certifications on trending topics as regular colleges and universities take years to update their curriculum. Participants commented:

- *“Provides knowledge on current topics, subjects that are not included in regular colleges/universities.”*
- *“Big gap in course update in regular college in terms of latest technology and equipment.”*
- *“Organizations should encourage online courses to increase the learning of employees as it will save cost, logistics, its easy, can be taught to larger audience in short time.”*
- *“In research, distribution, sales we hire people from online universities regularly.”*

Organizations across industries find them beneficial as they are cost effective, can be done from anywhere and are not hesitating to hire employees in roles such as Sales, Marketing, HR etc. Online education is increasingly becoming a viable option to address skill gaps that are not covered in regular colleges.

4.2.3.2 Facilitates large-scale workforce training

Results indicated that organizations are trusting online education and trainings to get their workforce build domain knowledge in a very short time-frame. This helps organizations to respond to the customer’s need efficiently. Some participants said:

- *“Helps to get quick domain knowledge to large team a short notice.”*
- *“Easy for organizations to train large number of employees in short span of time as per market trends”*

Online learning provides scalable platform for organizations to upskill large workforce efficiently and quickly as per dynamic market needs.

4.2.3.3 Builds digital, analytical, and AI-ready skills

Participants emphasized that online education is extremely beneficial to get knowledge on digital technologies, AI/ML, and analytical upskilling of employees. It allows individuals to access infinite education from anywhere in the world at affordable cost and according to their specific needs.

- *“Gives access to infinite courses, information and degrees available globally.”*
- *“Companies should promote online education and give 1-2 hours of windows every day to employees to upskill through online course.”*
- *“Improves analytical skills, digital skills like AI.”*

Some participants also informed that in Sales and Marketing their companies take female candidates with online degree holders. They quoted:

- *“For females, we take online candidates as well.”*

It shows that online education is becoming a powerful tool to encourage gender diversity in workforce.

4.2.4 Policy Framework for Online Degrees

A strong policy framework for online learning is need of the hour to facilitate its acceptance by the employers of pharmaceutical industry in India. Five themes emerged from the data related policy framework requirement:

4.2.4.1 Accredited and verified institutions only

Participants expressed that there should be clear guidelines set by policymakers for accreditation, course content, quality of faculty, monitoring process, and transparency of assessment process. Participants stated:

- *“Should be done from authentic and verified institutes.”*
- *“I feel many courses from premier institutes are highly valued in the industry as they have curated course content, great faculties, assessment process.”*
- *“Premier institutes provide collaborative approach, on-campus meeting with other students allows networking opportunities and they share thoughts.”*
- *“Hiring candidates with degrees from reputed institution’s gives me assurance about the quality and authenticity.”*

It shows the reputation of institution has strong influence on acceptability of candidates and establishing rigorous quality standards would enhance their acceptance by employers further.

4.2.4.2 Active government promotion

Government of India is strongly and actively promoting online education through different sources. It has launched several platforms like SWAYAM and making universities to encourage courses through online mode.

- *“Lot of support from government of India to promote and encourage online learning.”*

- *“Online education is not very matured for Indian market as US and Europe. Government should release strict policies for online education and promote this at large scale.”*
- *“I feel if Government promotes and supports online education this instills confidence and trust among employers.”*
- *“Government can ask regulatory institutions and universities standardize courses, set standard operating processes (SOP) for practical and assessments.”*

Above statements suggest that strong regulatory framework is needed along with active promotion of online learning by government. Online education is still at nascent stage in India compared to US and Europe and strict policies can help to increase the quality of online learning and gain confidence of employers.

4.2.4.3 Clear and strict regulations

Participants that strict and clear government regulations for online education are needed to get the confidence of the employers. Policymakers should ensure that the quality of education offered through traditional and online are at par. Regulations and guidelines from government should be same for traditional and online education. Few said:

- *“Government should make policy that online and offline mode of education are considered same.”*
- *“Anyone can open an institute online and start distributing certificates.”*
- *“No way I can trust if the degree and course is genuine.”*
- *“Due to lack of quality and standards even the degrees from government institutes like IGNOU has no value in industry.”*

Lacunae in quality and standards of online education make employers to doubt the degrees earned from government universities as well.

4.2.4.4 Academic and Industry Alliance

Results indicated that strong alliance between academic institutions and industries are required to make online education relevant for the employability of individuals. This alignment can help to develop courses as per trending market requirements and result in improved learning outcomes. Participants quoted:

- *“Industry and academics collaboration is required.”*
- *“Institutes should invite HR and recruitment people from industry to develop course as per their needs.”*
- *“Companies can provide internships in the final year of students to make them experience the actual industrial requirements.”*

4.2.4.5 Blended/Hybrid models preferred

Participants recommended blended/hybrid courses over complete online education as they provide on-campus visits, lab and equipment handling, and interaction with faculty and peers. Even occasional on-campus visits provide students and experienced professional immense opportunities of networking, team building, promotes discussions and idea sharing among themselves. Participants stated:

- *“Institutes should introduce blended/hybrid courses”*
- *“If blended courses can prove they instill enough practical knowledge, experiments, hands on then their students can be hired.”*

- *“Blended courses where lab work, and few classes are done in-person are more preferred.”*

4.2.5 Evolving Positive Views on Online Education in Pharmaceutical Industry

The acceptance of online education in Indian pharmaceutical industry is increasing as it requires continuous upskilling, changing global demands, quality control, and regulation and compliance needs. Five themes emerged from the data related to positive views about online education in Indian pharmaceutical industry:

4.2.5.1 Supports lifelong learning and post-retirement academic roles

Many participants think that online education is a very effective way to restart learning or in continuous education (CPE). As pharmaceutical industry requires niche skills, they can utilize their rich professional experience and domain knowledge in academic institutions or in consultant roles in premier institute after their retirements. With the help of online education, they can prove instrumental in bridging the academic industry gaps. Some of the participants stated:

- *“Will become advisor or lecturer in college with vast industry experience post-retirement.”*
- *“Pursuing online degree will help me to join university/college after retirement as faculty as I have immense domain/industry knowledge.”*

4.2.5.2 Strong relevance for pharma roles

Online learning has emerged as an effective medium to address the changing needs of the highly competitive pharmaceutical industry. It is continuously evolving and companies are encouraging its workforce to use online programs for digital upskilling, developing soft skills and develop management and leadership competencies. Some participants said:

- *“Many Pharma companies collaborate with Premier institute to develop courses as per the requirement like leadership, management, digital courses.*
- *“Online is evolving every day and is the future.”*
- *“Useful for Pharmacovigilance, Data analytics and Quality Management.”*
- *“All departments, depending on their knowledge. Useful for technical department as many digital courses available, HR department as soft skills related courses, quality department and so on”*

Participants acknowledged that several organizations are collaborating with academic institutions and provide internships that helps in developing industry-ready workforce.

4.2.5.3 Provides global access to quality programs

Participants emphasized that global quality agencies and regulatory bodies require certifications that are needed in pharmaceutical industries and have limited time duration (e.g. three years or five years). Professional can access any global level certifications through these online platforms from anywhere in the world. This makes them industry relevant. Participants stated:

- *“Many international agencies providing organization level certification such as ISO or QA require only regular courses done by pharma companies employees to certify the company.”*

4.2.5.4 Growing industry acceptance

Participants acknowledged that online is fast becoming new normal. With technological advancement and infrastructure developments it will be the future of education. It has become essential to address new age challenges related to pandemic, pollution, and evolving learning needs. According to participants:

- *“Online education is future.”*
- *“It has become new normal now and equally enriching.”*
- *“Few years down the line with technical advancements it will surpass regular colleges.”*
- *“It was belittled because of poor infrastructure, but now it is getting better day-by-day.”*
- *“Helps to handle new generation problems like Covid, pollution and online is only way.”*

4.2.5.5 High future potential in India

India has huge demographic benefit which is young and government is strongly backing online education. Online education has a promising future in India due to its new education policy (NEP2020), digital ecosystem, and technological advancements. Participants emphasized, *“It has huge potential in India. It should be promoted among*

students as it is cost effective.” Participants believed that online education is a key enabler in meeting the learning requirements of India’s population.

4.3 Summary of Key Findings

a) Interviews Summary

- The majority of interview participants were male (9 out of 10) with most falling in the age range of 41-50 years (4 out of 10).
- Most participants held professional degree (8 out of 10) and acquired their degree from regular college (8 out of 10). Most participants held roles ranging from middle management to executive positions (9 out of 10).
- There were mix of participants from various departments ranging from Marketing and sales (3 out of 10), followed by R&D and IT (1 out of 10) in each department.
- Majority of participants were from private sector (9 out of 10) with most from big organizations having more than 20,000 employees (4 out of 10).
- Majority (7 out of 10) of the participants had hired candidates with online degrees.
- 8 out of 10 participants who have hired candidates with online degrees earlier confirmed they will hire in future also if the candidates have basic college level degree from regular and additional/professional degree from online.
- Around 4 out of 10 admitted they relied on resume to identify the mode of degree earned recognized medium and 3 out of 10 verified during BGC or during interview.

- Most participants had personal experience with online learning, including CPE programs (7 out of 10), and were familiar with others who had positive or mixed experiences with online education (8 out of 10).
- 7 out of 10 participants admitted they will prefer hiring candidates from regular college; however, 8 out of 10 said they will prefer candidates with industry experience with online degree.
- 8 out of 10 participants confirmed for promotion experience, skill, values offered by employee matters more than degrees.

b) Survey Summary

Given below are the survey findings of participants who were directly involved in hiring and promotion decisions.

- The majority of participants were male (7 out of 10) and aged between 35–44 years (5 out of 10).
- Most participants had a post-graduate or professional degree (8 out of 10) and were at middle to senior management positions (8 out of 10).
- The majority of participants worked in private sector (8 out of 10), were from metro-politan cities (6 out of 10) and were part of large organizations.
- Every 9 out of 10 participants had taken online course with many completed or pursuing CPE. Majority (4 out of 10) who have prior experience with online learning were from start-ups and mid-level organizations.
- 7 out of 10 participants who have taken online course were male and approximately half of them were from age range 35-44; and majority of them belonged to metro politan cities (6 out of 10).

- 3 out of 10 participants who have taken online course were female and approximately half of them were in age range 35-44 having pursued CPE.

Hiring and Evaluation

- Majority participants agreed that the job roles clearly defined qualifications and skills required for the job position (9 out of 10).
- Half of the participants said they did not accept online degrees at par with traditional (50% disagree, 33% neutral and 16% agree)
- Majority of participants did not find graduates having degree completely from online mode job-ready (71% disagree, 20% neutral, 9% agree).
- 8 out of 10 participants said their organization recognize online degree programs.
- About half of the participants (5 out of 10) felt that online education is still not fully equipped to meet specific requirements of pharmaceutical industry such as R&D, Manufacturing, Clinical Trials, quality control, compliance etc, a significant proportion were either neutral (3 out of 10) or positive (2 out of 10)

Perception about Online Education

- Majority of participants (8 out of 10) confirmed traditional or hybrid degree is better for specialized industry like pharma.
- Most participants (6 out of 10) participants acknowledged that reputation of institution awarding online degrees is very important.
- Majority of participants reported favorable view for online learning, with large population (68%) being neutral and 17% agreeing that mix of online and traditional coursework has limited importance during evaluation.

- A large population (65%) responded that online learning still needs improved structure and academic rigor, 30% were neutral and 5% stated that it is at par with traditional education system indicating gradual improvement.

Hiring Preferences

Fresher Hiring

- Most candidates preferred traditional degree while comparing with blended programs (9 out of 10).
- Majority (9 out of 10) candidates preferred traditional when comparing between traditional and fully online.
- While comparing between blended and fully online, 4 out of 10 preferred blended and for fully online 3 out of 10 were either neutral or preferred online (1 out of 10).

Experienced Hiring

Preference for traditional degrees gradually declined for experienced hiring indicating acceptance towards fully and blended learning.

- Traditional degrees were preferred over traditional (8 out of 10) while comparing between traditional degrees and blended, half of the candidates had neutral views about candidates with degree from blended college.
- Between traditional and fully online, majority favored traditional (8 out of 10).
- While comparing blended and fully online, more than half preferred blended and for fully online education, (6 out of 10) were either neutral or preferred online education (3 out of 10).

Promotion Preferences

- For promotion, between traditional degrees and blended, 7 out of 10 preferred traditional, whereas 4 out of 10 preferred candidates with degree from blended college.
- Between traditional and fully online, 7 out of 10 favored traditional, while 6 out of 10 majority were neutral (6 out of 10) or preferred online (3 out of 10).
- While comparing blended and fully online, more than half preferred blended and for fully online education majority were either neutral (6 out of 10) or preferred online (3 out of 10).

c) Hypothesis Summary

- Employers' perception of equivalency of online degrees with regular degrees was analyzed and it was found that the perception of employers significantly influences their decision to hire or promote candidates with online degrees.
- Employers were more willing to hire candidates who earned their online degrees from institutions with accreditation, high reputation and offering courses that are relevant for industrial needs.
- Employers were more inclined to hire candidates with online degrees in support departments such as HR, Admin, Finance and IT.

CHAPTER V:

DISCUSSION

5

5.1 Discussion and Interpretation of Results

There are several factors that influence an employer's perception towards online education while making hiring or promotion decisions. This research is aimed to study the perception about online education by employers in the pharmaceutical industry of India. The study adopted mixed-methodology where quantitative data was collected by surveying 361 professionals and qualitative data was collected through semi-structured interviews of 33 participants who were directly involved in hiring and promotion decisions. Participants included wide range of departments, roles, age, levels of education, organizations (small to large, government to private sector and start-ups), from different cities. Firstly, the survey data was collected and analyzed to identify trends followed by interviews to get deeper understanding about employers' views, perceptions, organizational policies and constraints, policymakers' role and involvement, institutional limitations and so on.

Research Question 1

Do the employers of Pharmaceutical Industry in India perceive on-line and on-campus education as equivalent during hiring?

Employers of pharmaceutical industry of India compare online and traditional degrees during hiring and promotion based on several factors such as job roles, position,

entry criteria, institutions, type of education, hierarchy etc. Interview findings indicated the perception about online education is overall balanced but slightly inclined towards traditional mode of education. Majority of interview participants 55% had positive views about online degrees, whereas 18% had mixed views and only 27% held negative views. It shows a clear positive perception about online education.

When comparing learning modes, opinions were overall balanced but marginally inclined towards traditional education. 27% participants felt that online education is either better or as par with traditional mode of education, whereas 70% found offline mode of education better citing reasons such as faculty interaction, effective feedback mechanism, practical training, instrument handling and so on. Remaining 3% did not express any views.

For hiring advantage, a majority 70% of interview participants asserted that there are definitely advantages in hiring candidates with online degrees as they pursue several courses that are not taught in regular colleges, strong digital skill, and equipped with latest technologies and knowledge required in evolving pharmaceutical industry. Only 30% felt there is no advantage in hiring people with online degrees. In contrast, 90% participants considered there are disadvantages in hiring candidates as the qualification cannot be verified, candidates lack social and interpersonal skills. 6% did not see any disadvantage and 3% never hired anyone with online degrees.

The organization support for pursuing online degree was visibly very high. 90% participants reported that their organizations support online degrees/certifications, 48% acknowledged that their organization even sponsors online education and has collaboration, only 10% indicated absence of organizational support. Despite

organizational support for online education, 81% participants indicated their organization does not have a formal policy to hire online graduates and requires minimum graduation level degree from regular college.

Research Question 2

How do employers in the Indian pharmaceutical industry compare degrees obtained through traditional education with those earned through online education during fresher and experienced hiring?

The interview findings showed there is a clear inclination among employers toward hiring traditional degree holders than candidates with fully online degrees. 69% participants reported there is a clear difference between quality of online and offline degree and they would prefer traditional degree holders during hiring. In contrast, 31% stated there is no difference between online and offline education and they would not discriminate while hiring.

When comparing online degree quality, 69% of participants reported offline degree holders are better whereas 15% said both online and traditional degree holders are at par, and 12% said online degree holders are better than traditional degree holders. 3% did not express any views.

Interview findings depicted employers' careful acceptance of online degree holders. 21% interview participants confirmed that they had hired people with fully online degrees and 58% said they have hired people who had completed graduate level degree from regular college and pursued post graduate or professional degree through online or blended mode. Around 21% said they did not hire people with online degree.

Interview findings also showed increasing acceptance for online education for hiring in future. About 88% participants who already had hired candidates with fully online degrees or graduate with regular college and professional degree from hybrid or online mode confirmed they would hire candidates with online degrees in future as well. Only 6% who did not hire candidates with online degrees or hired with condition said they will not hire online degree holders in future and 3% did not express any views.

The experience level strongly influenced the acceptability of online education. A majority, 84% interview participants reported online degree holders are more suitable at experienced level after gaining a few years of experience in the pharma industry, whereas only 9% said it is beneficial at all levels. A small proportion 3% each reported mode of degree acquired does not matter at all or were not sure.

Survey findings showed clear difference in employers' preference according to candidates' experience level. Traditional degrees are strongly preferred for freshers hiring. When comparing traditional and blended mode of learning, 96% participants preferred traditional degree holders, and only 32% preferred candidates who got degree through blended mode. Around 42% remained neutral for hiring candidates with blended degree. In comparisons between traditional and fully online education, a majority of participants 96% preferred traditional degree holders. Only 8% showed preference for complete online course, 23% were neutral and 69% were not in favor of hiring people with fully online degrees.

While comparing blended and fully online modes, 45% favored blended, 42% were neutral for blended and only 13% were against hiring candidates with blended degrees.

Whereas 9% favored hiring candidates with fully online degrees, 30% were neutral and 61% were against hiring freshers with fully online degrees.

For hiring experienced professionals, employers were more flexible for hiring online degree holders. When comparing between completely traditional and blended mode of learning 79% preferred traditional degree holders, and 20% were neutral showing no preference for mode of degrees. Around half (48%) preferred candidates who got degree through blended mode, 50% were neutral and only 2% were against it.

When comparing traditional and fully online, 80% preferred traditional degree holders, and 20% were neutral. For complete online course 28% showed preference, 63% were neutral and only 8% were not in favor of hiring experienced people with fully online degrees.

Between blended and fully online course, 51% favored blended and 48% were neutral for blended mode. Whereas 27% favored hiring experienced candidates with fully online degrees, 61% were neutral and 11% were against it.

About 48% interview participants felt that online degree holders are more suitable for support department, 21% felt that they are good in all departments based on requirement and skill, 12% said they are not fit for any department and 6% each said they are fit for technical department. 6% each did not want to express their views or had no idea in which department they would fit.

Overall data clearly indicate employers' preference for hiring in the order: ***complete traditional degrees are most favored followed by degrees earned through blended mode while fully online degrees are least favored.*** Both interview and survey findings show that Indian pharmaceutical employers trust traditional degree especially

for freshers and technical roles. Online and hybrid learning are more acceptable at the experienced level where practical experience, skill and performance are valued more than degrees.

Research Question 3

How do employers of Indian Pharmaceutical Industry perceive degrees earned online compared to traditional on-campus qualifications when making promotion decisions?

The interview analysis showed the Indian pharmaceutical industry employers do not clearly prefer online or offline mode of education while making promotion decisions. Around 70% participants said there is difference between online and offline education and 30% felt both online and offline education are at par. A majority 78% participants stated they would not differentiate between online and offline degrees while making promotion decisions, 19% said they would prefer online and remaining 3% preferred candidates with offline degrees.

More than half (51%) participants felt that online or blended education helps professionals to develop leadership qualities, 36% did not agree with this and 13% held mixed views about this. An important finding was related to whether online degrees can compensate for technical expertise and practical experience. A majority 73% interview participants stated the online education can not compensate for technical expertise and practical experience, 24% felt it can compensate and 3% held mixed views.

In survey findings, when comparing between completely traditional and blended mode of learning for promotion decisions, 70% preferred traditional degree holders, and

30% were neutral. Around 45% preferred candidates who got degree through blended mode, 53% were neutral and only 2% were against it.

When comparing traditional and fully online, 67% preferred traditional degree holders, and 32% were neutral. Around 30% participants preferred fully online degrees, 64% were neutral and only 6% were not in favor of promoting people with fully online degrees.

Between blended and fully online course, more than half (51%) participants favored promoting candidates with degree earned through blended mode and 47% were neutral. Whereas 28% favored promoting candidates with fully online degrees, 65% were neutral and only 6% were against it.

Findings showed that employers in the Indian Pharmaceutical industry value experience, skill, performance and leadership qualities more than mode of education during promotion decisions. Blended education is preferred more than fully online degrees showing employers respect balanced traditional knowledge along with digital expertise. Fully online education is not viewed as substitute for technical excellence or practical exposure, reinforcing industrial experience for career progression.

Research Question 4

Which segment in Pharmaceutical Industry in India: Small, Medium, Large or Start-ups are more receptive and open for online degrees?

Different scenarios were given to survey participants including Freshers' hiring, Experienced hiring and Promotion decisions across varying company sizes. For freshers' hiring, when traditional degrees were compared with degrees earned from 50% regular

college and 50% digital mode, the maximum number of respondents preferring traditional degrees were from small sized companies (78 out of 361) and starts-ups (71 out of 361). Blended degrees were preferred mainly by respondents from small-size (33 out of 361) followed by very large companies (27 out of 361).

When compared between fully traditional and fully online degrees, participants from small sized companies again showed preference for traditional degrees (79 out of 361) followed by very small/start-ups (71 out of 361). In contrast, maximum number of respondents who preferred candidates with fully only degrees were from very large companies (11 out of 361) followed by small size company (8 out of 361).

When blended and fully online degrees were compared for fresher hiring maximum number of respondents selecting candidates with blended mode were from small-size company (48 out of 361) followed by very large companies (38 out of 361). In contrast, maximum number of candidates with online degrees were selected by participants from very large companies (12 out of 361) followed by small-size companies (7 out of 361). Details are given in Table 46 to Table 51 below:

Hiring for Freshers: Scenario 1: Traditional vs Blended Degree

Table 46: Applicant A: Earned degree entirely from Traditional College

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	22	49	1	1	1	74
>20000	15	45	6	1	1	68
10001-20000	7	18	1			26
1001-2500	16	38				54
2501-5000	25	53	1			79
5001-10000	18	39	2		1	60
Total	103	242	11	2	3	361

Source: Author's work.

Table 47: Applicant B: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	12	2	34	24	2	74
>20000	21	6	30	10	1	68
10001-20000	5		10	9	2	26
1001-2500	15		25	14		54
2501-5000	32	1	30	15	1	79
5001-10000	22		21	17		60
Total	107	9	150	89	6	361

Source: Author's work.

Hiring for Freshers: Scenario 2: Traditional vs Fully Online Degree

Table 48: Applicant A: Earned degree from Traditional College

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	24	47	2		1	74
>20000	19	43	5	1		68
10001-20000	6	20				26
1001-2500	15	39				54
2501-5000	27	52				79
5001-10000	19	38	2		1	60
Total	110	239	9	1	2	361

Source: Author's work.

Table 49: Applicant B: Earned degree entirely through online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	2	2	15	46	9	74
>20000	8	3	21	27	9	68
10001-20000			5	16	5	26
1001-2500 s	4		11	38	1	54
2501-5000	8		23	39	9	79
5001-10000	3		8	43	6	60
Total	25	5	83	209	39	361

Source: Author's work.

Hiring for Freshers: Scenario 3: Blended vs Fully Online Degree

Table 50: Applicant A: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Total
<1000	17	4	41	12	74
>20000	27	11	23	7	68
10001-20000	8		8	10	26
1001-2500	16	4	27	7	54
2501-5000	40	8	29	2	79
5001-10000	22	6	24	8	60
Total	130	33	152	46	361

Source: Author's work.

Table 51: Applicant B: Earned degree entirely through online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	4		27	36	7	74
>20000	8	4	23	24	9	68
10001-20000		1	4	18	3	26
1001-2500	4	1	19	30		54
2501-5000	6	1	24	41	7	79
5001-10000	2		12	40	6	60
Total	24	7	109	189	32	361

Source: Author's work.

Hiring for Experienced Professionals

For experienced' hiring traditional degrees continued to be favored by employers.

When traditional degrees were compared with blended degrees, the maximum number of

respondents favoring traditional degrees were from small companies (63 out of 361) followed by very large (55 out of 361) and mid-size (54 out of 361) companies. Respondents who selected candidates with blended mode were majorly from small-size (44 out of 361) followed by mid-size companies (35 out of 361).

When compared between fully traditional and fully online degrees, majority (61/361) of respondents from small-size companies preferred candidates with degrees earned from traditional colleges followed by very large (55 out of 361). In contrast maximum number of respondents who preferred candidates with fully online degrees were from small size companies (25 out of 361) followed by very small size company (20 out of 361).

When blended and fully online degrees were compared, blended mode was clearly favored. Maximum number of responded preferring blended degrees were from small-size company (45 out of 361) followed by mid-size companies (38 out of 361). In contrast, respondent favoring fully online degrees were from small size companies (22 out of 361) to very small-size companies (20 out of 361). Details are given in Table 52 to Table 57 below:

Hiring for Experienced: Scenario 1: Traditional vs Blended Degree

Table 52: Applicant A: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Strongly Disagree	Total
2501-5000	48	15	16		79
<1000	38	12	23	1	74
>20000	28	27	12	1	68
5001-10000	38	16	6		60
1001-2500	30	11	13		54
10001-20000	9	14	3		26
Total	191	95	73	2	361

Source: Author's work.

Table 53: Applicant B: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	43	1	35			79
<1000	28	2	42	1	1	74
>20000	21	3	41	3		68
5001-10000	35		23	2		60
1001-2500	25	2	27			54
10001-20000	12		12	2		26
Total	164	8	180	8	1	361

Source: Author's work.

Hiring for Experienced: Scenario 2: Traditional vs Fully Online Degree

Table 54: Applicant A: Earned degree entirely traditional College

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	50	11	18			79
<1000 employees	41	11	20	1	1	74
>20000 employees	26	29	12	1		68
5001-10000	38	16	6			60
1001-2500	31	10	13			54
10001-20000	11	13	2			26
Total	197	90	71	2	1	361

Source: Author's work.

Table 55: Applicant B: Earned degree entirely through online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	23	2	53	1		79
<1000	12	3	55	3	1	74
>20000	16	2	35	9	6	68
5001-10000	16		40	4		60
1001-2500	19	1	33	1		54
10001-20000	8		12	5	1	26
Total	94	8	228	23	8	361

Source: Author's work.

Hiring for Experienced: Scenario 3: Blended vs Fully Online Degree

Table 56: Applicant A: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
5001-10000	36	4	20			60
2501-5000	38	7	34			79
1001-2500	20	6	28			54
10001-20000	10	3	12	1		26
>20000	24	9	35			68
<1000	23	5	45		1	74
Total	151	34	174	1	1	361

Source: Author's work.

Table 57: Applicant B: Earned degree entirely through online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
5001-10000	16	1	37	5	1	60
2501-5000	20	2	54	3		79
1001-2500	19	1	33	1		54
10001-20000	7		12	6	1	26
>20000	16	1	31	12	8	68
<1000	13	2	55	3	1	74
Total	91	7	222	30	11	361

Source: Author's work.

Promotion Decisions

For promotion decisions, when traditional degrees were compared blended degrees, the maximum number of respondents preferring traditional degree were from small companies (56 out of 361) followed by mid-size (55 out of 361) and very large-size (49 out of 361) companies. Respondents who selected candidates with blended mode were majorly from small-size (39 out of 361) followed by very large size companies (35 out of 361).

When comparing between fully traditional degrees and fully online degrees, majority (54/361) of respondents from small-size companies preferred traditional degrees followed by large size (49 out of 361) and very large (48 out of 361). In contrast, fully online degrees were preferred from small size companies (26 out of 361) followed by very big size company (25 out of 361).

When blended and fully online degrees were compared for promotion, maximum number of respondents favoring blended degrees were from small-size company (47 out of 361) followed by mid-size (39 out of 361) and very large (38 out of 361) companies. In contrast, respondents from small size and very large size companies showed acceptance for online degrees (24 out of 361) each. Detailed analysis is given in Table 58 to Table 63 below:

Promotion Decisions: Scenario 1: Traditional vs Blended Degree

Table 58: Applicant A: Earned degree through entirely traditional College

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	42	14	22	1		79
<1000	33	7	33		1	74
>20000	29	20	19			68
5001-10000	37	14	9			60
1001-2500	27	6	21			54
10001-20000	11	11	4			26
Total	179	72	108	1	1	361

Source: Author's work.

Table 59: Applicant B: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	36	3	39	1		79
<1000	19	3	50	1	1	74
>20000	29	6	32		1	68
5001-10000	32	2	25	1		60
1001-2500	20	2	32			54
10001-20000	13		12	1		26
Total	149	16	190	4	2	361

Source: Author's work.

Promotion Decisions: Scenario 2: Traditional vs Fully Online Degree

Table 60: Applicant A: Earned degree through entirely traditional College

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	42	12	24	1		79
<1000	36	5	32		1	74
>20000	27	21	20			68
5001-10000	34	15	11			60
1001-2500	25	3	26			54
10001-20000	13	9	3	1		26
Total	177	65	116	2	1	361

Source: Author's work.

Table 61: Applicant B: Earned degree through entirely online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
<1000	11	3	59		1	74
>20000	20	5	31	6	6	68
10001-20000	7		14	5		26
1001-2500	17	1	36			54
2501-5000	24	2	52	1		79
5001-10000	20	1	38	1		60
Total	99	12	230	13	7	361

Source: Author's work.

Promotion Decisions: Scenario 3: Blended vs Fully Online Degree

Table 62: Applicant A: Earned degree through Blended college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	40	7	31	1		79
<1000	24	3	44	1	2	74
>20000	27	11	29	1		68
5001-10000	34	5	21			60
1001-2500	17	3	34			54
10001-20000	10	3	12	1		26
Total	152	32	171	4	2	361

Source: Author's work.

Table 63: Applicant B: Earned degree through online college

No of Employees	Agree	Strongly Agree	Neutral	Disagree	Strongly Disagree	Total
2501-5000	22	2	54	1		79
<1000	10	3	60		1	74
>20000	22	2	32	6	6	68
5001-10000	17	2	40	1		60
1001-2500	16	2	36			54
10001-20000	5		14	7		26
Total	92	11	236	15	7	361

Source: Author's work.

Among interview participants, majority (4 out of 33) from very large organizations stated during hiring decisions they see no difference between online and offline

candidates for experienced role. Whereas 23 out of 33 participants stated they would prefer offline candidates. No interview participant showed preference for candidates with degree earned only through digital mode for fresher hiring. For promotion decisions, small number (3 out of 33) of participants who preferred candidates with online degrees were from very large organization. Additionally, 10 out of 33 participants who felt that promotion depends mainly on skill, attitude, leadership and managerial skills than degree was also from very large organizations.

Both survey and interview results showed that degree from regular colleges are most preferred irrespective of participants organization size. Degrees earned through blended mode are becoming favorable alternative whereas fully online degrees are gaining steady acceptance majority from small sized (2500-5000 employees) to very large size (>20,000 employees) organizations. It can be concluded that blended learning is emerging as the most favored alternative mode of education among employers.

Research Question 5

What knowledge, skills and qualities should be developed by the online degree holders to ensure equal employability as degree holders from traditional face to face college?

Given below are the suggestions and recommendations provided by interview participants that online holder could adopt to increase their chances of “hireability” as equal to regular degree holders:

- Accreditation and Credibility check of academic institutions: There are several institutions offering abundance of online degrees, courses and certification.

Students need make careful and informed decision while selecting courses based on the credibility of institute, industrial value and relevance of course, quality of faculty, rating of the institute, and their examination process. Above all, the attitude of the student towards gaining knowledge from the course is most important.

- Strong real-time industry and technical knowledge: Online degree holders must develop and showcase in-depth industrial knowledge, comprehensive technical and core concepts, instrument handling and awareness of real-world problems which are essential to establish their competency for the job.
- Relevant Industry Exposure: Online degree holders need to take up projects, internship, simulations and case studies that would help to bridge the gap between online theoretical knowledge and industrial experience. Starting the work from grassroot level will help to learn the nuances of their field to deliver results.
- Digital Skills: Students should build strong digital skills required in their industry such as Automation, AI/ML, cloud technology, Digital Twins, and other emerging technologies as per their area of interest.
- Effective Communication and People Management: Candidates should develop strong communication skills and collaborative approach. Technical and practical competency may help to get a job, but long-term career growth depends heavily on teamwork, professional conduct and interpersonal attitude. Adaptability, respect for seniors and co-workers, work ethics, and listening skills play greater role in successful professional career and providing results.

- **Performance Evidence:** Individuals should showcase academic projects, internships, get recommendations and endorsements, connect and build network on social sites to show their talent and increase trust and credibility by future employers.
- **Develop Continuous Learning attitude:** Individuals should show commitment towards improving their performance, adaptability and learning new skills and technologies.

Research Question 6

What implementation measures can be recommended to boost the acceptability of online education in Pharmaceutical Industry in India?

Suggestions and recommendations provided by interview and survey participants included:

- **Robust accreditation mechanism:** Regulatory agencies in India such as UGC and AICTE should establish strict norms for institutions' accreditations, perform audits on regular basis and continuously monitor the performance of institutions based on feedbacks and recommendations provided by agencies.
- **Standard Academic Curriculum:** Regulatory bodies should work with Indian and International institutions to implement standard courses that ensure consistency, industrial relevance, and are aligned with emerging technologies. They should also collaborate with international commercial and academic institutions to offer standardized courses required in the pharmaceutical companies.

- **Support from Policymakers and Governments:** Policymakers, regulators, government and think tanks should promote online programs, provide clear guidelines to increase the quality of online learning, incentives for institutions offering online education to digital upskilling, encourage pharmaceutical companies to start absorbing talents from institutions offering online and blended courses.
- **Blended courses:** Academic institutions should offer blended courses with short term campus residency where candidates will get practical knowledge, instrument handling, lab exposure, team work and interpersonal skills. Institutions should develop application-based pedagogy, regulatory and compliance framework and quality management.
- **Quality of Faculty and Mentors:** Academic institutions should on-board faculty with strong academic and industry knowledge. They should also arrange regular workshops and lectures from industry experts. Additionally, government and regulatory bodies should make framework to evaluate the performance of faculty on regular basis.
- **Assessment System Transparency:** Academic institutions should work hard to ensure the transparent examination system and assessment of projects build by students. This is necessary to gain the trust of the employers and establish the credibility of institutions.
- **Industry-Academic Alliance:** Academic Institutions should closely work with pharmaceutical companies to develop courses as per current market needs, update curriculum, work of actual industry problems and companies should provide few

weeks of internships to students to get them familiar with real industry work environment.

- Testimonials and interactive sessions by Alumni: Academic Institutions should actively collect and present testimonials from alumni, their success journey and career growth. They should also organize sessions with pharmaceutical companies that have recruited their graduates. This will help to build trust, enhance credibility and showcase talent developed by digital education.
- Employers' Awareness about online programs: Industry associations and confederations should partner with academic institutions to improve employers' knowledge about online and blended education. Many employers in India are still not aware that many government and private institutions offer science and pharmaceutical courses these modes. Raising awareness about online programs will help to eliminate employers' hesitations about online education, build trust and help in informed hiring and promotion decisions.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6

6.1 Summary

This research analyzed the perception of Indian Pharmaceutical employers for online degrees during hiring and promotion decisions using findings from literature review, surveys and semi-structured interviews. Prior studies indicate that online education has witnessed an impressive growth in India due to its convenience, no need to travel to institutes, self-paced learning, flexibility, cost-effectiveness and work-life balance. Research findings showed that although online learning can provide technical knowledge, it still needs to work on providing practical knowledge, lab experience, robust feedback mechanism, faculty interaction and team-work required by the highly regulated and skill based pharmaceutical industry.

Findings showed a clear employer's preference for face-to-face degrees during freshers hiring, with blended learning as was next favorable option. Employers expressed concerns regarding lack of practical knowledge and laboratory skills, weak technical and industry knowledge, and shady online assessment process. They also reported issues with institutions credibility, authenticity of curriculum, faculty quality and interpersonal skills of candidates. However, during experienced professionals hiring and promotion decisions, employers showed greater flexibility towards online programs where industrial experience and skills earned through real-industry exposure outweigh mode of education. Employers acknowledged the importance of online learning in upskilling large workforce

at short span of time, global access of courses from anywhere in the world, development of leadership and management skills, particularly for experienced professionals.

The growing acceptance of online learning aligns with Equivalency Theory which emphasizes on learning outcomes than mode of education. Online learning, especially blended learning provides effective alternative medium for upskilling and acquiring knowledge allowing candidates to compete equally with traditional learning. The study recommends measures for academic institutions and policymakers to increase the acceptability of online learning including enhanced accreditations, strong regulatory framework, transparent assessment process, industry and academic collaborations, creating awareness among employers and strong government promotions and encouragement.

6.2 Implications

Consistent with earlier studies conducted by Adams & Defleur, (2006), this study also indicated that employers in the pharmaceutical industry prefer traditional degrees during hiring and promotion decisions. However, this bias is lower than what was found in earlier studies showing a gradual acceptance for online degrees. This bias is seen specifically more when hiring for freshers. Employers are more flexible towards online and blended learning during hiring and promotion of professionals with previous industry experience highlighting importance of skill, experience, industry competencies, performance and exposure to real life situations. The study also showed startups, small and mid-sized companies are more flexible for online degrees. Study indicated that online degrees are more acceptable in support departments and role where specialized technical

or digital skills are required such as pharmacovigilance, data analytics, sales, marketing, HR, IT – intensive departments and departments where soft-skills are required. Research also showed that employers in general do not find any specific advantage or disadvantage by hiring online degree holders provided they showcase their capabilities, expertise, knowledge and skills required for the job.

6.3 Recommendations for Future Research

Although the survey used in this research included open ended questions to get participants views, it did not provide them sufficient chance to explain the rationale behind their responses. Future research should be performed including a true mixed-methodology approach combining quantitative surveys with qualitative interviews to get deeper knowledge about employers' views on online learning. Longitudinal studies are recommended to track the career growth and promotion outcomes of traditional, blended and online learning over a considerable time period. Future studies should analyze the effectiveness of computer simulations, virtual labs and other digital technologies to bridge the gap between actual laboratory and digital platforms. Finally, future studies could investigate if there are any biases in the salary and perks provided to the online degree holders compared to traditional degree holders.

6.4 Conclusion

This research studied the perception of employers of Indian pharmaceutical industry for traditional, blended and online degrees during hiring and promotion decisions. The results showed that the traditional, face to face degrees are preferred for

freshers hiring and technical roles specially R&D, manufacturing, Quality and other lab-intensive departments and roles. Blended learning that comprises online learning with on-campus face to face learning is emerging as the most preferred alternative for traditional education. Fully online learning is gaining momentum for hiring of experienced professionals demonstrating employers put great value on industry experience, performance and skill. The acceptance of online degrees also depended on size of the organization with small and med-size organizations showing higher acceptability of online degrees. Findings indicated that online degrees are more acceptable in support functions and roles that require deep domain specific knowledge, digital skills or soft skills. The research indicated if the learning outcomes and skills offered by online/blended education are comparable with traditional education then the employers are more flexible to accept these learning modes.

This research highlights the need for strong Industry-academic collaboration, employers' sensitization about online education, robust accreditation norms, standardized courses, and result oriented education. NEP 2020, UGC regulation and Government directives play important role in improving quality and increasing acceptance of online education in pharmaceutical industry of India which provides an effective medium for workforce development, bridge digital skill gap, and address talent shortage.

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