

Interpretations and Impact of New Education Policy 2020 on Indian Higher Education for Industry 4.0

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Abstract

Industry 4.0 is revolutionizing the way industries work using emerging technologies and trends. And there is a tectonic shift in the work culture and hence the job market. There exists a gap in the skills the industry is looking for and what the curriculum offers, which leads to educated unemployment. The dynamically changing industry demands for aligning the higher education system with the growing demands of the industry. The survey was conducted to understand the stakeholder's views about the competency mismatch and challenges in Indian higher education for Industry 4.0. Also, the recommendations of New Education Policy 2020 were studied for restructuring the curriculum to improve employability. Though New Education Policy 2020 aims to provide high-quality education the implementation seems difficult in developing countries like India where it lacks the availability of basic infrastructure. It does not address the transition required to be industry-ready and how to integrate and implement the concept of holistic development, lifelong learning, and student-centric project-based approach of teaching and learning, outcome-based education to narrow the existing industry-academia gap.

Keywords: Higher education, New Education Policy 2020, Gap, Industry 4.0, Education

Introduction

Education is the process of enabling learning, acquiring knowledge, skills, values, beliefs, and habits that are necessary for the overall development of an individual. For the first time in Indian history, an ambitious and futuristic education policy has been introduced known as 'New Education Policy 2020'. Under the chairmanship of eminent scientist, Dr. K. Kasturirangan, Former chairman of the Indian Space Research Organization (ISRO) recommendations are made to New Education Policy 2020. (Kumar & Nagrani, 2020) It has been designed in such a way that it proposes to change the system right from primary to higher education. New Education Policy 2020 (NEP) would disrupt and changes in the existing education system would be made with the growing changes in the knowledge landscape.

The New Education Policy would have a constructive and long-lasting impact on the higher education system. There is a need for Industry-based education to bridge the gap between what we offer to the

students and what is the need of the industries for Industry 4.0. The major reason for brain drain is the lack of favourable professional opportunities and the growing rate of educated unemployment here in India. Also, there is a greater inclination of students for studying abroad because of the quality education, highly rewarding career advantage and overall development and growth. New Education Policy 2020 has been aimed to change India into a global knowledge superpower and to highlight the importance of experiential learning, creativity, and imagination. (Akhter, 2020)

Promising technologies like the Robotics, Artificial Intelligence (AI), and Internet of Things (IoT) are changing the global manufacturing, industrial processes, and people in a fast-developing economy like India. In the past few years, the use of technology has grown considerably and played a key role in facilitating quality and sustainability. Digital Technology has significantly supported various domains at the time of the sudden COVID-19 outbreak.

Industry 4.0 is about the emerging technologies disrupting the Indian industry. To take the best advantage of Industry 4.0 there is a necessity for multidisciplinary higher education for knowledge-based learning. The same has also been proposed in New Education Policy. To keep up with the change, there is a need to revisit the traditional education system with an innovative and revolutionary approach. Students should be adept with skills of the fast-

changing technology; they should be mentored than instructed; information should be made accessible and not fed to them. To compete with the workforce both general and vocational education should aim at making students skill ready. The goal of the National Education Policy is to transform India into an information giant with a focus on learning, research, and innovation to be spread worldwide.

Challenges of Indian Higher Education

Higher education in India is yet to witness progress due to the transformations from conventional teaching to a blended, hybrid modern teaching pedagogy. None of the Indian universities is in the top 100 institutional Quacquarelli Symonds (QS) World University Rankings 2020. IIT Bombay, IISc Bangalore, and IIT Delhi, that is only 3 top brands from India are out of 200 institutes in QS World University Rankings 2020 (QS World University Rankings 2020: Top Global Universities | Top Universities, n.d.). This fact indicates that Indian institutes fail in academic and employer reputation, teaching quality, levels of internationalization, educated unemployment, inadequate research contribution and funding, poor track record in awards and recognition to name a few. (Manivasakan, 2020)

Various factors structurally challenge the current monodisciplinary higher education model. Following are the challenges faced by Indian higher education—

Table 1: Challenges - Traditional higher education model

S.No	Challenges	Reason	Proposed Solution
1.	Teaching methodology	Focus is more on rote learning and spoon-feeding. Obsolete pedagogies - theory-based learning	Case-based approach Experiential learning Leverage formative assessments Inculcating life-long learning by using Study –Work–Relearn–Reskill approach (Thapliyal, 2016)

2.	Outdated curriculum	<p>Absence of Outcome - based education</p> <p>Standardized curriculum</p> <p>Lack of connect ion with the industry</p> <p>Unable to match globalization and technological advancement</p>	<p>Continuously updated education</p> <p>-introducing upcoming technology and trends as per the industry's requirements in consultation with industry experts and government.</p> <p>industrial visits, internships, and guest lectures to update on industry trends.</p> <p>Project-based learning/ fieldworks/ Hands -on experience</p> <p>SCALE-UP (Student-Centered Active Learning Environment for Undergraduate Programs)/ collaborative learning (Beason-Abmayr et al., 2021)</p>
3.	Lack of updated skill sets	<p>Unaware of the upcoming technology and trends</p> <p>Low-quality education is imparted.</p> <p>Lack of research – research collaboration needs to be strengthened, enriching research quality</p>	<p>Acquiring necessary skills and competencies to familiarise and use new technologies for changing teaching and learning process, Faculty development program.</p> <p>Updating the pedagogical skills and content knowledge(Abdelrazeq et al., 2016)</p> <p>Research culture to be promoted and enhance d throughresearch funding (Salah et al., 2020)</p> <p>E-learning platforms like Diksha, e -Pathshala, Swayam,</p>

			<p>SwayamPrabha, National repository of open educational resources (NROER) , and Nishtha to be promoted.(<i>Government Online Learning Platforms For School Students - e-Learning</i>, n.d.)</p> <p>Industry mentors to guide students on the upcoming technological trends (Aithal& Aithal, 2020)</p>
4.	Infrastructure	Lack of Facilities/Laboratories	<p>Laboratories sharing and virtual labs – an effective way of learning, for conducting experiments anytime and anywhere, money is saved and risk of damaging the equipment/injury is reduced. (<i>Virtual Labs</i>, n.d.)</p>
5.	Job opportunity & qualification mismatch - demand and supply gap in the talent value chain	<p>change in existing job roles.</p> <p>new jobs are created for Industry 4.0</p>	<p>Skill for problem -solving, working in mission -based teams, focus on experiential learning and cognitive skills (<i>Need For Bridging The Industry-Academia Gap</i>, 2017)</p> <p>Promoting the use of Government initiatives like SWAYAM and MOOCs, open educational resources like the National digital library</p>

			(NDL)(Aithal& Aithal, 2020) continuous learning and unlearning adapt to the dynamic work environment. Internship to fill in the knowledge gap
6.	The rigid separation of disciplines between humanities, science, arts, etc.	The area of study is restricted. Students' overall development, autonomy for innovation is limited	multidisciplinary programs (<i>Mahindra Group Launches University for Interdisciplinary Learning</i> , n.d.)
7.	Access to higher education in rural, remote, and socio-economically poor areas	Lack of resources and correct information	Online platforms Use of radio and TV in low internet connectivity areas
8.	Absence of an empowered and strict regulatory system	Bogus institutes cheat students	Promote excellent institutions
9.	Learner's Attitude and interest toward learning	to adopt new skills - upskilling and reskilling	Broader learning opportunities Self-Motivation Capacity-building based on the KAIZEN principle of continuous improvement (Umeda et al., 2019)

			Promoting entrepreneurship Applying Bloom's Taxonomy for improved understanding (1) <i>(PDF) Attainment of Higher Level of Blooms Taxonomy through Open Ended Activity in Metrology & Quality Engineering Lab, n.d.)</i>
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These initiatives need to be aligned with the existing education system to overcome the challenges.

Recommendations of NEP2020 and its Implications on Higher Education in India

After completing professional degree programs, there is a huge demand for additional training to become industry-ready (Büth et al., 2017). This indicates that there is a gap between what the University curriculum offers and what the industries are looking for. The overlooked gap between academia-industry is the root cause of educated unemployment. Industry and academia are two diverse fields operating on dissimilar platforms and standards. The ideologies and purposes of both are different. However, both are interconnected. The job-readiness of pass-outs is negligible as the students lack practical knowledge and industry exposure.

New Education Policy 2020 is predicted to bring notable and all-inclusive changes to the existing education system. It focuses on holistic development, multi-disciplinary approach, internship, familiarising school students with coding to bring in innovation, creativity, encouraging

analytical and logical thinking, outcome-based learning. (MHRD, 2020) The policy aims to inculcate in students the ability to learn emerging trends.

Gross Enrolment Ratio (GER) in Higher and vocational education in India for the year 2019-20 is 27.1%, according to the All India Survey on Higher Education (AISHE) (AISHE Report 2019-20, n.d.). By 2030 it is expected to reach 50% if we follow the recommendations of new education policy and reforms.

New Education Policy 2020 expects and recommends dynamic changes to the higher education to weaken the issues faced and thus delivering excellent competent education.

Following are the recommendations as per New Education Policy 2020 and its implications on Higher Education in India

Table 2: Implications and Mapping of need (as per Industry 4.0) with NEP 2020 recommendations

S. No	Mapping of need (as per Industry 4.0) with NEP 2020 recommendations	Implications
1.	Signing an agreement with foreign universities and setting up their branches in India	Global quality of education in India

2.	Introducing multi-disciplinary institutes	Emphasis on areas like arts, humanities The overall growth of students Stronger knowledge base Blended Learning
3.	Introducing a single common entrance test	The Stress of multiple entrance exams will be reduced
4.	Single regulatory body	For maintaining the same standard of education across India
5.	Multiple entries and exit program	Would help in lifelong learning. The credits gained can be secured in academic credit banks
6.	Technology-based adult learning	To ensure lifelong learning (Govinda, 2020) ICT-equipped libraries and Adult Education Centres to facilitate learning through apps, online courses, TV channels
7.	Online content in regional vernaculars for ease of understanding the content	Sometimes the students drop out because of the English language barrier. Talents from the rural areas can be promoted
8.	Curriculum, pedagogy, assessment pattern needs to be revised	Student employability will get enhanced. Expansion in high-quality employment opportunities Inclusion of skill courses, internships, project, and practical based learning, learning by doing

9.	Peer-reviewed research to be funded by National Research Foundation	To propagate research -intensive culture at colleges and universities
10.	Online education and Open Distance Learning (ODL)(Musa et al., 2020)	Underprivileged as well as disadvantaged students will get benefitted

Research Methodology

The researcher conducted a survey and analysed the effectiveness and challenges of the New Education Policy in higher education.

Primary Data is collected through observations, questionnaires, and Interview techniques.

Journals, research papers, websites, and newspapers were studied, and secondary data was collected to find out the positive and negative impact and challenges of the New Education Policy that will be faced by the education

stakeholders and the steps that can be taken by the Indian government to support higher education to bridge industry-academia gap.

The targeted population is the stakeholders in higher education - educators, academicians in Pune city, Maharashtra, India.

Descriptive Statistics on the factors that are more relevant and must be incorporated in higher education from student's perspective to resolve the problem of educated unemployment:

Table 3: Recommendations in higher education model

S.No	Recommendations	Mean	Standard Deviation
1.	Lifelong learning	3.74	1.17
2.	Continuously updated curriculum	3.79	0.90
3.	Teachers as facilitators	3.55	0.94
4.	Stakeholder's engagement	3.80	1.09
5.	Student-centric learning	3.93	1.17

1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: strongly agree

The five-point Likert scale is considered an interval Likert scale. The data collected is analysed using Excel Data Analysis.

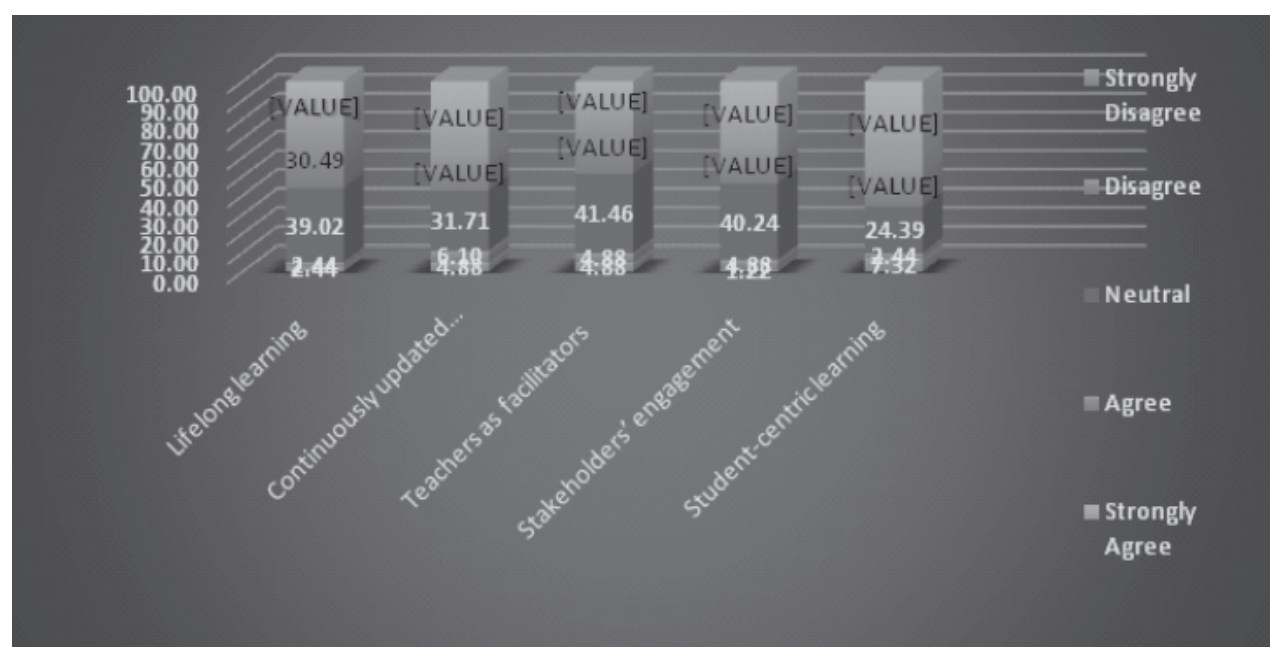
The results were tabulated on the satisfaction-importance matrix, and it was revealed that “Lifelong learning”, “Continuously updated curriculum”, “Teachers as facilitators”, “Stakeholder's engagement” and “Student-centric learning” were very important to students and that students were least satisfied on these dimensions and need more emphasis to ensure employability. Institutes must

take initiatives on enriching the students' education experience and satisfaction by focusing on these factors that contribute to the success of the NEP in the Industry 4.0 era.

The figures below indicate that more than 70% of the respondents feel that emphasis on the above mentioned factors is essential for bridging the industry academia gap and enhance employability.

Table 4: Recommendations in higher education model – Percentage wise analysis

S.No	Recommendations	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Lifelong learning	2.44	2.44	39.02	30.49	25.61
2.	Continuously updated curriculum	4.88	6.10	31.71	19.51	37.80
3.	Teachers as facilitators	4.88	4.88	41.46	28.05	20.73
4.	Stakeholders' engagement	1.22	4.88	40.24	19.51	34.15
5.	Student-centric learning	7.32	2.44	24.39	21.95	43.90

Table 5: Graph representing recommendations in higher education model.

The results were tabulated on the importance matrix, and it was revealed that “Knowledge upgrade”, “Cultivating research culture”, was very important to make the academicians competent to be able to impart innovation,

would change their teaching pedagogy. Student and faculty centric models need to be developed to upgrade skills and knowledge, enhance research culture in the days to come.

Table 6: Recommendations in higher education model

S.No	Recommendations	Mean	Standard Deviation
1.	Knowledge upgrade	3.76	0.82
2.	Cultivating research culture	3.74	1.05

Educating for Industry 4.0

Industry 4.0 means an interconnected world i.e., bringing the digital and physical worlds together. It has led to the revolution of industries with the blend of developments in evolving technologies like the Internet of Things (IoT), 3D printing, artificial intelligence (AI), robotics. It has a great impact on existing and future jobs. (Sumer, 2018) However, the 21st-century jobs will be intellectually demanding, and the impact will be just as much as those labour-intensive activities that were transformed forever by the industrial revolution of the 19th century. There is a need to embrace the technologies associated with Industry 4.0 to address the fast-growing employability changes. Institute for the Future (IFTF) report predicts 85% of jobs that have not been thought of will emerge by 2030. (Dell Technologies | 1, n.d.)

In the context of Industry 4.0, there is a growing demand to be T-shaped, interdisciplinary capabilities, and ample

knowledge of additional fields. This additional knowledge helps to enhance their field of expertise. (To Flourish in the Fourth Industrial Revolution, We Need to Rethink These 3 Things | World Economic Forum, n.d.)

Key components of sustainable economic development viz. education, employment, and entrepreneurship if interlinked, well-connected, can help to mitigate the risk of uneducated unemployment. To make people fit for the workplace digitalization and other competencies need to be incorporated.

To take full advantage of the opportunity created by Industry 4.0, the following developments and inclusions in higher education can benefit to meet the needs of the educators and learners of tomorrow: -

Table 7: NEP 2020 recommendations in higher education and its benefits

S.No	Recommendations	Benefits
1.	Lifelong learning	Learn, unlearn, relearn. Keeping up to date on latest technologies
2.	Continuously updated curriculum	Tailor-made courses for learning path as per the capability, liking, and interest. choice based to study the subjects of own interest, relevance and help in career. Curriculum to be in sync with the changing times. Emphasis on soft skills along with technical skills - broad and complementary skillset

		Embrace divergence and pluralism thereby overcoming the divide between arts, science, and humanities. Internship for Workplace Exposure, Hands-on experience Aligning curriculum changes with changes in pedagogies and assessments
3.	Teachers as facilitators	Rote learning to be replaced by assignment and project - based learning to enhance experiential learning where teachers only guide or mentor the students for the overall development. Assessment and feedback at all levels for continuous improvement
4.	Stakeholders' engagement	To make a larger eco-system by taking the benefit of their experience and expertise Focus on holistic well-being than academic performance only. Process and outcome -based education (<i>OECD Future of Education and Skills 2030</i> , n.d.)
5.	Student-centric learning (Mohan, 2019)	For better engagement and involvement Improved understanding of concepts Enhanced ability to apply the theory into practice

Conclusion

With the exponential growth of disruptive technologies educated youth is unable to find high-quality jobs in the modern industries of Industry 4.0. There is a need to develop new skills among youth that can serve the demand for the future by empowering them with employable skills and by shifting the focus from teaching to learning thereby changing the equation of acquired education with knowledge gained.

It is required to appraise the education systems and prepare the learners with the skills to be future-ready global citizens. This transformation calls for shifts in learning content to include both the technical and human-

centric skills and modifications in learning experiences that more thoroughly reflect the future of work.

To lead this shift in the education system stakeholders must be prepared to create holistic education systems. The process of Industry 4.0 will mark an improved contribution in attaining the Sustainable Development Goals (SDG) with more efficient use of natural resources, human capability, and advanced technology. The New Education Policy 2020 can be seen as a ray of hope to bridge the gap between what the traditional education offerings and what Industry 4.0 demands. The Education policy if implemented appropriately can help us reach new heights in the time to come.

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