# NSDC CONNECT

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DATA DRIVEN POLICY MAKING
**NOWCASTING & HIGH FREQUENCY INDICATORS**

THE NANDURBAR STORY
**THE INSPIRATIONAL JOURNEY OF AN ASPIRATIONAL DISTRICT**

AI IN EDUCATION
**A VISION OF EMPOWERMENT**

## EMPOWERING INDIA'S FUTURE

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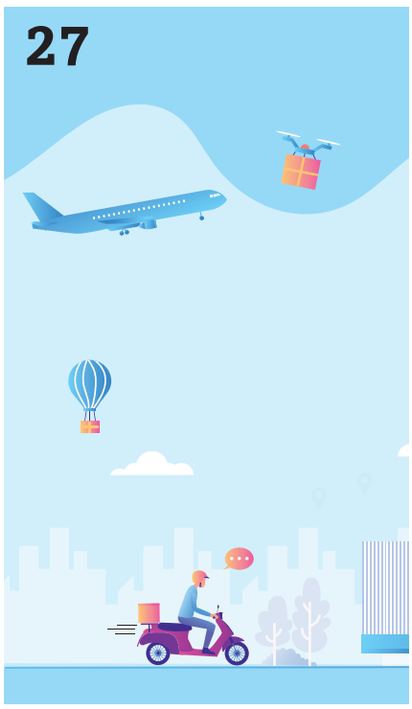
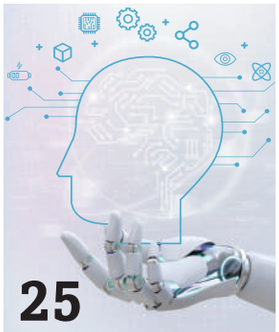





Dear Readers,

Welcome to the latest edition of NSDC Connect!

In this edition, we are bringing stories of innovation, creativity, and leadership from across the Skilling Ecosystem in our country. As we explore the dynamic landscape of skill development in India, our spotlight story delves into the innovative approach of nowcasting and the analysis and evaluation of High Frequency Indicators (HFIs) to drive data-backed decisions within the policy landscape. We recognise the pivotal role of data-driven decision making in shaping effective policies aligned with government goals, and the adoption of HFIs stands as a powerful and creative tool to enable data backed decision-making in supporting skilling interventions across the nation.

This is also the first edition where we are bringing an inspirational grassroots story about transformative socio-economic development unfolding in the Nandurbar district of Maharashtra. Members of our Research and Impact team ventured into the district in February 2024, engaging with entrepreneurs, government officials, farmers, and community leaders. Their accounts resonate with stories of resilience and community solidarity, epitomising the spirit of progress and determination driving local initiatives. We hope, that just as our team drew inspiration from these stories, you too will find these stories as a beacon of hope and trust in the entrepreneurial spirit, hard work, and determination of the people of Nandurbar.

Furthermore, we delve into the symbiotic relationship between Innovation and Entrepreneurship, acknowledging the latter as a cornerstone of economic advancement. In this story, we explore how encouraging critical thinking and entrepreneurship in school curricula, enabling ease of business, developing digital and financial skills, and supporting budding entrepreneurs through government schemes can generate substantial economic returns over a period of time.

We also bring to you a deep dive story about the role of Artificial Intelligence (AI) in revolutionising the education sector. Through this story, we learn how AI can facilitate the creation of high-quality curricular content and improve accessibility of learning materials at scale to deliver the required learning outcomes. We learn how acquiring the skill sets to leverage AI is essential to meeting the educational needs of our large and young population to make them future ready.

Continuing our tradition of amplifying voices from the forefront of the skilling ecosystem, this edition features insightful conversations with the CEOs of Sector Skill Councils (SSCs) for Logistics and IT-ITeS (Nasscom). We extend our gratitude to Mr. Ravikanth Yamarthy (CEO, LSC) and Ms. Kirti Seth (CEO, SSC IT-ITeS, Nasscom) for generously sharing their perspectives. Through their discourse, we glean invaluable insights into the essence of dignified work, the imperative of adaptability, and the essence of lifelong learning and re-skilling in navigating the evolving landscape of skills and livelihoods.

We also extend our heartfelt appreciation to Ms. Trishaljit Sethi (Director General of Training) and Ms. Nidhi Chaudhari, IAS (Commissioner, Skill Development, Government of Maharashtra) for their esteemed contributions to the Connect platform. NSDC Connect endeavours to foster an inclusive and collaborative space for public discourse on the multifaceted facets of the skilling ecosystem in India.

With each edition, we aim to illuminate the innovative strides and transformative endeavours shaping India's skilling landscape. I invite you to immerse yourselves in the enriching narratives and join us in our collective pursuit of a skilled, empowered tomorrow. Your feedback and contributions are instrumental in shaping the discourse on skill development in India and ensuring that our collective efforts yield sustainable outcomes for generations to come.

Thank you for your unwavering support and dedication to the mission of skill development.

Warm regards,

VED MANI TIWARI
**CEO, NSDC**

NSDC Connect embodies NSDC's values: Integrity, Innovation, Inclusion, and Impact. We aim to provide trustworthy, innovative, and inclusive content that aims to make a positive impact on education and skill development. Join us in reimagining a better future.

# DATA DRIVEN POLICY MAKING: IMPACT OF NOWCASTING & HIGH FREQUENCY INDICATORS

NSDC Connect Spotlight story for this issue dives into the significance of Data Driven Decision Making and nowcasting through monitoring of High Frequency Indicators within the realm of policy making and implementation. In the age of growing digitalization, advancements in data storage and compute capabilities, it is increasingly possible and important to take informed and targeted actions to solve complex socio-economic challenges of any economy, and through this article we delve further into the applications of HFIs in India's development journey.

**Introduction**

India is one of the fastest growing economies of the world with tremendous potential to become the global manufacturing and services hub, owing to the technological developments and relatively young workforce equipped with skills to cater to the global pool of businesses. IMF World Economic Outlook has predicted the size of Indian economy to increase from $3.2 trillion in 2021-22 to over $5 trillion in 2026-27[i].

Among the several measures undertaken to achieve this milestone, such as, a strong push for infrastructure investment, capital expenditure, performance linked incentive schemes, etc.; ensuring a steady supply of skilled workforce is absolutely vital. In order to enjoy the demographic dividend of a young population over next several decades, the vision of our policy makers is to build a 'Skilled India' that will unleash the human potential to create employment and entrepreneurship opportunities for millions of youths. There is a need to create a skills market that caters to the ever-growing and ever-changing demand for various skill sets that new businesses and modern technologies would require. The challenge for the policy makers in the skill development domain is, therefore, to keep up with the changes in all the three sectors—agriculture, industry and services in real time and facilitate the assembly of workforce well-equipped to meet these changes.

These considerations require that a policy maker uses the most accurate and reliable data available to predict outcomes and make recommendations. In the absence of a strong data-backed foundation, we risk the chance to going back to the often-cited adage of 'great policy, bad implementation'. A policy is only as effective as the outcomes it achieves and leveraging reliable and accurate data to formulate interventions can help bridge the gap between the intended and unintended consequences of the interventions.

**Data-Driven Decision Making for Effective Policy Outcomes**

Data-driven decision making is not a new concept and has consistently been used all around the world to solve complex macro-economic challenges as well as socio-economic problems in including Education, Skill-Development, Healthcare, Security, Nutrition and many more.

Traditional macro-economic data, like GDP or Consumer Price Index (CPI) may suffer from intrinsic publication lags, lack of topical and regional granularity and less accuracy in predicting ever-changing trends and dynamics in today's economies[ii].

For central banks around the world, timely information on economic activity plays a critical role in taking monetary policy decisions. During each round of the monetary policy of the Reserve Bank of India (RBI), available information set for decision-making is found to be highly asynchronous with the quarterly GDP data made available[iii].

There are two principal challenges related to traditional economic data—unpredictability of economic shocks and substantial revisions to the data over time making them incomparable. Such databases are not very useful in correctly identifying economic shocks and their significance in real time[iv]

To overcome this, nowcasting using the high-frequency indicators or variables captured through real-time macro data is being deployed.

**Application of HFIs to Track Economic Recovery Post Covid Pandemic**

Federal Reserve Bank of New York developed a weekly economic index (WEI) comprising a set of 10 HFI which is updated every Thursday[v]. The index also helps in estimating the quarterly GDP growth.

In case of Germany, the weekly economic activity index created by Deutsche Bundesbank uses HFIs comprising of monthly industrial output and latest GDP estimate. Similarly, in Europe, the ING weekly economic activity index (ING-WAI) was constructed to track the economy of eurozone[vi].

Real-time tracking of 46 countries by OECD is undertaken through a series of three weekly trackers[vii].

In India, both public and private stakeholders monitored the HFIs during the pandemic to track the course of economic activity under the emergency policy actions to contain the spread of infections. The Narrow Recovery Index by Citi Bank, Business Activity Index by State Bank of India, and Nomura India Business Redemption Index (NIBRI) became popularly discussed during the pandemic.

High Frequency Indicators (HFIs) are used by economists and policy makers around the world to track the progress of various aspects of the economy, which helps in identifying the dynamic requirements of the growing sectors and facilitate plans and programmes of skill development accordingly. In this article, we will be further exploring the use of Data-Driven Decision Making in public policy with a focus on HFIs, and its applications in India.

**Selected HFIs and their relevance for skill development**

Ministry of Skill Development and Entrepreneurship (MSDE), Government of India, has recognized the need for skill development efforts across the economy and aims to achieve this on a large scale with the speed and high standards to move towards the vision of a 'Skilled India'[viii]. MSDE's Vision 2025 aims to unlock human capital to trigger the productivity dividend and bring aspirational employment and entrepreneurship pathways to the working age population. One of the important pathways to achieve this vision is to create a skills market that is learner-centric and demand-driven. This requires data and decision-making tools driven by high frequency data to identify the right sectors and opportunities for skill development and match demand with supply in real time. HFIs, thus become relevant for this purpose.

**Table 1**

| Category | Indicator | Level of Aggregation | Periodicity (M- Monthly Q- Quaterly A-Annualy) | Source | Application to Skill Development |
|---|---|---|---|---|---|
| Labour Market Scenario | Unemployment Rate | National | M | CMIE CPHS | • Trends in unemployment, LFPR gives insights into the extent to which skilling and reskilling activities need to be undertaken.<br>• Sectoral and regional analysis of unemployment will point to specific areas for intervention.<br>• Relevant for RPL; training needs identification and promotion of NAPS specific sectors. |
| | Labour Force Participation Rate | | | | |
| | Employment Rate | | | | |
| | Net Payroll Additions - EPFO | National | M | EPFO | |
| Sentiments | Industrial Outlook Survey - Manufacturing | National | Q | RBI | • Useful to identify industry groups with increasing demand for skilled workforce based on the trends analysis and forecasting.<br>• Would also give a status of the past and current notion of economic conditions which when corroborated with sectoral trends will assist in identification of skilling interventions. |
| | Industrial Outlook Survey – Services | National | Q | RBI | |
| | Industrial Outlook Survey –Infrastructure | National | Q | RBI | |
| | Index of Consumer Sentiments (ICS) | National | M | RBI | |
| | Index of Current Economic Conditions (ICC) | National | M | RBI | |
| | Index of Consumer Expectations (ICE) | National | M | RBI | |
| | PMI Manufacturing | National | M | S&P Global | • Useful to identify manufacturing and service industry sectors with increasing demand for skilled workforce based on the trends analysis and forecasting.<br>• Can be correlated with the RBI Outlook Surveys for better targeting of manufacturing and service groups for skill development. |
| | PMI Services | National | M | S&P Global | |
| Sales/ Demand | Rail Freight | Division | M | Railway Dashboard | • Useful to identify the inter-regional goods movement to plan targeted skill building programmes.<br>• Useful indicator for the performance of various sectors and regions and can help in realigning existing skill development initiatives.<br>• Analysis of freight data from 2010 will be helpful in designing long-term policies and priority areas for skill development. |
| | GST Collections | State | M | Handbook of Statistics on Indian States (RBI), various State Governments | • GST collections would be a useful indicator to capture trends especially in the MSME sector enterprises that have registered for the GST.<br>• It will provide insights into the growth of MSMEs in different states and UTs and will inform specific policies and programmes to target skill development among MSMEs.<br>• Raw and disaggregated will segregate industry and product/service types as well as small businesses.<br>• E-Way Bills database will help identify the source and destination locations for planned skilling interventions. |
| | E-Way Bills | State | M | Ministry of Finance | |
| | Exports/ Imports | State | Monthly | Directorate General of Commercial Intelligence & Statistics, MCI | • Determine specific skill development initiatives required for sectors aligned with export promotion as well as import substitution.<br>• Important indicator to consider in the vision to make India the factory to the world and have a workforce that can cater to the global demand for skilled labour, especially in the modern technology sectors. |

| Category | Indicator | Level of Aggregation | Periodicity | Source | Application to Skill Development |
|---|---|---|---|---|---|
| Sales/ Demand | Exports/ Imports | State | Monthly | Directorate General of Commercial Intelligence & Statistics, MCI | • State and UT wise Import related raw data needs to be sourced. |
| | Gross State Value Added (GSVA) | State | Annual | MoSPI, State Governments | • Determines the economic health of the state and is a proxy to ascertain the workforce requirement.<br>• Triangulated with other indicators like employment and labour force participation, this will provide sound input to undertake various private and government skilling interventions. |
| | Automobile Sales | State | Quarterly | Parivahan | • Proxy of the disposable income of the citizens residing in the state.<br>• Will help in analysing the trends required for carrying skilling interventions. |
| | Power Consumption | State | Monthly | Central Electricity Authority, Ministry of Power | • Reflects the short to medium term trends on how manufacturing, services and infrastructure activities are performing in various states and UTs and help target skill development initiatives accordingly.<br>• Users are classified as per power consumption per month and even micro enterprises can be identified through the disaggregation of the raw data. |
| Mobility | Railway Passenger | Division | Monthly | Railway Dashboard | • Region wise disaggregated data will reflect seasonal trends for the migration corridors of the workforce.<br>• These migration corridors can be matched with the existing known migration corridors to give useful insights into migration and reverse migration trends.<br>• Pre-Covid, during covid and post-covid analysis of the raw data would further give useful insights into workforce migrations.<br>• Important indicator in designing long-term policies and priority areas for skilling and reskilling initiatives. |
| | Airport Passenger Traffic | State | Monthly | AAI, Ministry of Civil Aviation | • Just like Railway Passenger database, Airport passenger database will help in determining the trends of passenger movement.<br>• Will help in understanding migration movement especially for white collared workforce. |
| Digital Transactions | Digital Transactions<br>(Includes Debit/ Credit Card Payments, USSD, UPI, AEPS, Mobile Wallets and Others) | State | Monthly | etaal, MEITY | • Will provide insights into products and services provided by micro enterprises and individual businesses in the formal as well as informal sector (no other indicator captures informal sector as well as digital payments).<br>• This indicator tracks the trends in regular activities, seasonal variations and impacts of selected events or shocks on movement of products and services which serves as a good proxy to intuitively estimate the impact on workforce. |
| | ATM Payments | State | Monthly | NPCI | |
| Investments | Credit Disbursed | State | Annual | Basic Statistical Returns, RBI | |
| | Investments (Projects completed) | State | Quarterly | Department of Industrial Policy & Promotion, Ministry of Commerce & Industry | • Reflects the credit given to MSMEs, large industries, infrastructure, and diverse types of services.<br>• Time series analysis would provide insight into how different industries and services groups are expanding their operations and would potentially require a steady supply of skilled workforce. |

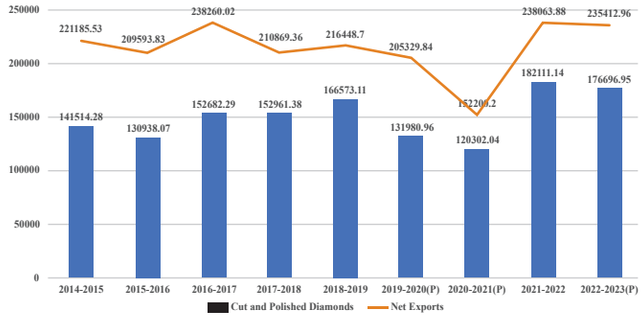
Table 1 shows the most relevant HFIs from the perspective of skill development. These HFIs are selected on the basis of their spatial availability, quality, periodicity and application in skill development policies and programme interventions.

**Case study of Diamond Industry in 2023:**

The market size of India's gems and jewellery business has witnessed an increase from US$ 78.5 billion as of 2020-21 to US$ 85 billion in 2022-23. This size is likely to expand to US$ 127 billion by 2027 and the exports from the sector are likely to reach US$ 100 billion by 2027[ix]. The diamond exports form a major part of the exports from the sector. Globally, India was the top exporter of cut and polished diamonds with the market share of 33% in 2021.

Figure 1 below depicts the trends in exports of diamonds and overall net exports from the gems and jewellery sector from India between 2014 and 2023[x]. There was a steady increase in the exports of cut and polished diamonds from ₹ 1,309.38 billion in 2015 to ₹ 1,665.73 billion in 2019. The dip during the Covid-19 pandemic is visible between 2019 and 2021, with the exports market picking up again in 2021-22 and 2022-23 (provisional estimates). Similar trends can be seen in the data on net exports with a significant drop in the value between 2019 and 2021 and market picking up again in 2021-22.

**Figure 1: Trends in the exports from the gems and jewellery sector (2014-2023)**




The provisional estimates for the first two months of FY 2023-24 show the exports of cut and polished diamonds at ₹ 255.65 billion, with the monthly average lower by about ₹ 19 billion compared to the average monthly exports in 2022-23. The gross exports declined from US$ 39.2 billion in FY 2021-22 to US$ 38.1 billion in FY 2022-23. In only one month of April 2023, there was a significantly large decline of 30% YoY compared to April 2022[xi]. Export of cut and polished diamonds declined by 38.9%, polished lab grown diamonds by 34.6% and polished synthetic stone by 30.1% in April 2023 compared to April 2022.

Table 2 gives the region-wise growth/decline in gross exports between FY 2021-22 and FY 2022-23. In April 2023 compared to April 2022, there was a decline of 75.7% in the gross exports from Surat SEZ, and 41% decline from Delhi SEZ. Overall, there was a 43.5% decline between recorded exports of US$ 598 million in April 2022 and US$ 337.6 million in April 2023. The exports to USA (which is the largest export market for gems and jewellery sector from India) declined by 36.4%, UAE by 18.5%,

**Table 2: Region-wise growth/decline in gross exports in gems and jewellery sector**

| Region | Gross exports (April 2022) US$ million | Gross exports (April 2023) US$ million | % of Growth / Decline |
|---|---|---|---|
| Western region | 2634.27 | 1719.04 | -34.74W |
| Southern region | 169.22 | 95.97 | -43.29 |
| Rajasthan | 84.33 | 88.07 | 4.44 |
| Gujarat | 390.07 | 179.51 | -53.98 |
| Northern region | 390.07 | 179.51 | -53.98 |
| Eastern region | 80.26 | 69.63 | -13.25 |
| Overall total | 3372.29 | 2160.59 | -35.93 |

*Source: GJEPC (2023), available at https://gjepc.org/statistics.php*

Hong Kong by 45%, Belgium by 27.9%, Israel by 27.4%, Singapore by 48.7%, Thailand by 61.8%, Japan by 53.5% and Switzerland by 75%.

India imports and polishes 80-90% of the world's rough diamonds[xii]. The diamond sector employs 1 million people directly and impacts 5 million jobs indirectly[xiii]. Following the sanctions imposed by the USA on Russian diamond mining company Alrosa following the Ukraine war, the supply of rough diamonds has been slashed globally by almost 30%. Alrosa is the largest diamond producer in the world and the supply constraints are expected to be continued following the sanctions on Russia. This has led to a sharp increase in the price of rough diamonds as well as the insistence of the USA and EU on certificates of origin, making the exports to these blocks a challenge[xiv]. Given that the price volatility in rough diamonds is passed on to the prices of polished diamonds and the long operating cycle in this business, the operating profitability of the diamond polishers is expected to decline 75-100 basis points to 4-4.25% in 2023[xv]. The festive season of 2022 and pent-up demand post-Covid led to businesses stocking up on rough diamonds. But the onset of Russia-Ukraine war and disruptions in the Chinese market due to new variants of Covid-19 led to a massive correction in the market in Q1 of FY 2023-24.

The continuing slump in demand for cut and polished diamonds in the USA, EU and China impacted about 4,000 diamond processing units. This had the potential to push thousands of skilled workers out of jobs as per industry estimates[xvi].In order to understand the trends in unemployment in the diamond sector and implement skill development (reskilling and upskilling) initiatives, real-time data would be required to understand the current scenario. The following HFIs would be analyzed for this purpose:

- **Unemployment rate:** The Periodic Labour Force Survey (PLFS) reports as well as the CMIE surveys provide quarterly updates on the unemployment rates across the states. The micro level (raw) data could be obtained from the National Statistical Office (NSO) to investigate the state-level or regional trends in unemployment, specifically pertaining to the gems and jewellery industry. This would allow for identification of regions where specific skill development initiatives will be required for the skilled workforce to prevent them from moving into semi-skilled or unskilled jobs and losing the productivity.

- **Export-import statistics:** Export-import statistics pertaining to the gems and jewellery sector can be obtained from the Ministry of Commerce and Industry in real-time to understand the month-on-month trends in exports and imports of cut and polished diamonds, and rough stones, respectively. This will help in understanding the market trends to help the nowcasting and put in place strategies for dealing with unemployment and skilled unemployed.

- **GST collection:** Trends in GST collection based on the analysis of micro level data can be used to identify the new hotspots of job losses and partial suspension of production in the gems and jewellery sector.

The above HFIs, with proper investigation of the databases and analysis, would better inform the skill development initiatives by allowing identification of job losses region-wise job losses in the gems and jewellery industry. For the diamond sector, even the migration corridors data need to be integrated along with the unemployment data to produce better informed skill development programmes.

The challenge in this exercise would be to obtain micro level and granular data from the ministries and agencies which gather and maintain the databases. It would, however, be a worthwhile exercise to maintain updated databases for these indicators and pick up early trends on people's movements in and out of diamond sector to design training and skill building interventions in a meaningful manner.

**Conclusion**

The growth momentum experienced by the country and the demographic dividend it enjoys through the relatively young population in the workforce need to be matched with the appropriate skill development strategies. This will help create greater employment and entrepreneurial opportunities and unlock the vast potential that youth have to offer. Skill building, thus, holds the key to achieving and maintaining the growth momentum across different sectors of the economy and make India the skill capital of the world.

Skill development policies, plans and programmes will have to keep up with the ever-dynamic economic indicators or cues to help match the demand for specific skill sets with supply. In this regard, the high frequency indicators like unemployment rate, industry outlook surveys, rail freight and passenger movement, power consumption, credit growth, UPI payments, etc. would provide extremely useful information to base the decisions regarding skill development initiatives. These indicators are maintained by different entities both within the government and private enterprises.

It will be important to disaggregate the data with as much granularity as possible and analyze them regularly to understand growth trends across different sectors and workforce movement to better inform all policies and programmes to be undertaken for skill development. The application of high frequency indicators to skill development initiatives is, therefore, vital and should be focused on as a top priority.

**References:**


i. World Economic Outlook, October 2022: Countering the Cost-of-Living Crisis (imf.org)
ii. Macrobond - https://www.macrobond.com/blog/high-frequency-indicators-a-goldmine-of-real-time-information
iii. Real-Time Monitoring of the Indian Economy – RBI Bulletin August 2022
iv. A. Jain (2019), Macro Forecasting Using Alternative Data, Chapter 11, Handbook of US Consumer Economics, Elsevier
v. Weekly Economic Index (WEI) - FEDERAL RESERVE BANK of NEW YORK (newyorkfed.org)
vi. think.ing.com
vii. Tracking activity in real time with Google Trends | en | OECD
viii. Home | Ministry of Skill Development and Entrepreneurship | Goverment Of India (msde.gov.in)
ix. IBEF (2023), Gems and Jewellery, India Brand Equity Foundation
x. www.indiastat.com
xi. GJEPC (2023), Gem and Jewellery Trade Update, Data and Analytics Unit, Gems and Jewellery Export Promotion Council India
xii. https://www.thehindubusinessline.com/markets/gold/indian-diamond-industry-may-lose-shine-due-to- russia-ukraine-war/article65204011.ece
xiii. https://www.thehindu.com/business/business-matters-how-will-the-wests-upcoming-sanctions-impact- indias-diamond-industry/article66703935.ece
xiv. https://www.businesstoday.in/latest/economy/story/indias-diamond-industry-could-see-a-15-20- contraction-in-revenues-in-fy23-crisil-342593-2022-07-25
xv. https://www.businesstoday.in/latest/economy/story/indias-diamond-industry-could-see-a-15-20- contraction-in-revenues-in-fy23-crisil-342593-2022-07-25
xvi. https://www.arabianbusiness.com/politics-economics/indias-diamond-industry-lose-sparkle-pushing-20000- workers-out-of-job



## Arpit Asthana

Manager, Research & Impact, NSDC

Arpit is a software engineer turned development practitioner with over 12 years of experience. A double Masters (MBA from Xavier Institute of Management Bhubaneswar and a Master's in development studies from Tata Institute of Social Sciences Mumbai), Arpit is a former Prime Minister's Rural Development Fellow (PMRDF) and have worked extensively in the rural hinterlands of the country.



## Dr. Archana Patankar

VP, Research & Impact, NSDC

Dr. Archana Patankar is a Researcher and Practitioner with substantial National and International experience in the field of Climate Change, Health and Environment. She holds PhD in Economics from Indian Institute of Technology Bombay (IITB) and has recently completed LLM in Energy and Environmental Law at Birmingham Law School, University of Birmingham.

# IMPACT STORIES

# TRANSFORMING ITIs THROUGH AR AND VR BASED LEARNING

While better educational tools to assist teaching have constantly been sought by researchers and teachers, the significance of digital learning methods was greatly manifested during the pandemic. Artificial Reality (AR)/ Virtual Reality (VR) is one of the digital technologies which has found wider acceptability as it provides immersive experiences in a wide range of industries and in the education domain.

Experiencing real time scenarios and upgrading to the ever-evolving industrial needs can be difficult and expensive, especially for those applications which are excessively cost intensive or hazardous for humans. VR completely transforms this scenario as students can individually record and work/learn by visiting scenarios multiple times without additional expense, while being secure in a classroom environment.

To be a front-runner in promotion of modern immersive learning environment among the Industrial Training Institutes (ITIs), the National Instructional Media Institute (NIMI) under the aegis of the Directorate General of Training (DGT) has implemented a pilot project for delivering VR based training content on four popular trades namely Fitter, Electrician, Welder, and Mechanic Motor Vehicle. This has been done in collaboration with IIT Bombay incubated EnggOnline Feast Software Pvt. Ltd. and VR based training content has been provided as a pilot to five Government ITIs, namely, ITI Nagaon in Assam, ITI Ambernath in Mumbai, Maharashtra, ITI Bhubaneswar in Odisha, ITI, Aligani in Lucknow, Uttar Pradesh; ITI Kancherapalem in Vishakhapatnam, Andhra Pradesh. The pilot project was implemented under STRIVE (Skills Strengthening for Industrial Value Enhancement) project implemented by DGT with assistance from the World Bank. VR content has also been created for above mentioned four trades.

In this pilot project spread over five geographical locations, over 350 students from Government ITIs participated in VR based learning in their institutes. More than 50 instructors were trained for the implementation of the VR based learning for seamless exposure to the trainees. The ITI students appeared quite enthusiastic while using the VR headset and wielding the joystick for learning tasks like welding, navigating the assembling and reassembling of parts of

VR Implementation-ITI Aliganj, Lucknow


VR Implementation-ITI Nagaon, Assam

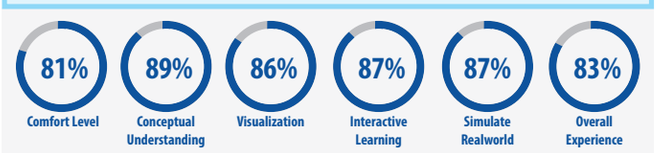
motor vehicle, fitting, assembling, and shaping of equipment and machine parts, making electrical circuit etc. The state government officials and Principals of the ITIs also participated in the pilot project and provided inputs on cost effectiveness and user friendliness of the VR based learning system.

A mixed-method study of the pilot project was also conducted to assess its impact. The primary data for the study was collected from various stakeholders ranging from students, trainers, Principal of the ITIs/and State Directorate officials.

**Feedback received from ITI students**

**Key Insights:**

- The students had a positive experience while using AR/VR .
- Coupled with the traditional advantage such a as classroom discussions and group activities, in-person interaction and hands on practical training, the AR & VR learning methodology will enhance the understanding and learning of the candidates.
- Close to 80% of the students in the focus group prefer both the traditional and AR/VR learning methodology equally.

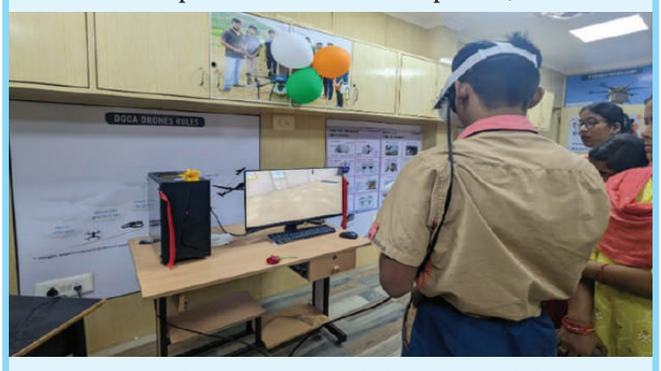



**Feedback from Trainers/instructors**

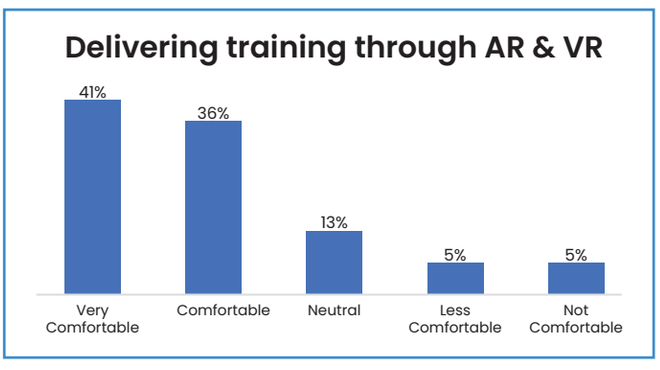
- More than 75% of the trainers feel comfortable delivering training through AR/VR.
- Close to 60% of the trainers feel that AR/VR training is more time efficient than the practical training.
- Close to 25% of the trainers feel that the content delivered can be improvised to make it on-par with the traditional learning.
- More than 85% of the trainers feel that the content quality is good.

Principals of the respective ITIs highlighted that the trainees' understanding will improve through the VR mode of learning delivery. They want to include the method of learning through VR content as a part of curriculum as the AR/VR teaching methodology

VR Implementation-ITI Visakhapatnam, AP



VR Implementation-ITI Bhubaneswar, Odisha




In essence, Virtual Reality (VR) is demonstrating its efficacy to provide learners with an immersive and interactive experience, allowing them to comprehend challenging concepts and ideas more efficiently and effectively. This is reinforcing several research studies which have found that VR in the field of education enhances various paradigms of learning including constructivism learning, experiential learning, and learning through problem solving, etc. Efforts are ongoing to scale the implementation of AR/ VR further based learning across other skilling centres, and thus realizing the vision of making India the Skill capital of the World.

## Trishaljit Sethi

Director General of Training, MSDE

Mrs. Trishaljit Sethi is working as Additional Secretary & Director General (Training) in the Ministry of Skill Development & Entrepreneurship (MSDE). The DGT is responsible for providing the policy framework for the Craftsmen Training Scheme run in the Industrial Training Institutes. She has experience of working with the Govt of India for over three decades. She has worked in several capacities including in the Department of Posts, Department of Personnel & Training, Prasar Bharati Ministry of Information & Broadcasting and National Thermal Power Corporation (NTPC) Ministry of Power.

# SKILLING FOR THE LAST MILE: LAUNCHING PM VISHWAKARMA SCHEME IN MAHARASHTRA


Maharashtra has a rich legacy of skilled artisans, from potters to blacksmiths, who have played a vital role in shaping the state's cultural and economic identity. Today, this legacy continues to thrive through the "Skilled Maharashtra, Employable Maharashtra" initiative, empowering these artisans and propelling the state's future growth. Furthermore, a key player in this initiative is the Maharashtra State Skill Development Society (MSSDS).

Functioning under the Skills, Employment, Entrepreneurship, and Innovation Department of the Maharashtra government, MSSDS acts as the Nodal Agency for planning, coordinating, executing, and monitoring various skill development initiatives. MSSU implements various schemes funded by the Central government, state government, and districts. To further solidify its commitment to artisan empowerment, MSSDS recently signed an agreement with the National Skill Development Corporation (NSDC) to be the Training Partner for the PM Vishwakarma scheme in Maharashtra. Launched on 17th September 2023, the PM Vishwakarma Scheme stands as a cornerstone initiative of the Government of India. Its ambitious goal is to **empower and elevate the lives of artisans and craftspeople, also known as *Vishwakarmas*.**

The PM Vishwakarma scheme envisions a transformative shift in how these artisans practice their ancestral trades. By equipping them with the necessary skills and resources, the program aims to elevate their socio-economic standing and enhance their quality of life.

The scheme encompasses eighteen diverse trades, including carpentry, pottery, blacksmithing, and tailoring. This broad spectrum ensures that a significant portion of the artisan community can benefit from the initiative.

**The PM Vishwakarma scheme provides a multifaceted approach to empower these artisans. This includes:**

- **Recognition:** Artisans receive official recognition through a PM Vishwakarma Certificate and ID Card, acknowledging their skills and expertise.

- **Skill Upgradation:** The program offers basic short-term training of 40 hours followed by an advanced skill training of 120+ hours to hone existing skills and learn new techniques.

- **Toolkit Incentives:** Upon successful skill verification, beneficiaries receive a toolkit incentive of ₹15,000 at the start of their basic training. This incentive is distributed electronically through e-RUPI/e-vouchers and can be used at designated centers to purchase the upgraded toolkits.

- **Training Stipend:** Each beneficiary receives a daily training allowance of ₹ 500 during both the Basic and Advanced Training programs. This financial support is deposited directly into their bank accounts through Direct Benefit Transfer (DBT) upon successful completion and certification by MSDE.

- **Credit Support:** Under the PM Vishwakarma scheme, targeted beneficiaries receive collateral-free enterprise development loans of up to ₹300,000. The loan is disbursed in two tranches—the first tranche for ₹100,000 with an 18-months repayment period, and the second for ₹200,000 with a 30-months repayment period. The Government of India offers an 8% interest subvention on this loan, bringing the interest rate down to 5%.

Maharashtra boasts a rich history of structured planning, particularly in trade and commerce. This legacy can be traced back to the ancient system of Bara-Balutedar, meaning "Twelve Tradesmen". This system comprised hereditary professions where the skilled individuals were compensated for their services with village produce through a complex barter system. Each tradesman, like *Sonar* (goldsmith), *Kumbhar* (potter), *Sutar* (carpenter), and *Lohar* (blacksmith), held a specific role passed down through generations. These twelve professions ensured the self-sufficiency of village communities, and with some adaptations, still functions in rural Maharashtra. Notably, the job roles covered under the PM Vishwakarma scheme directly align with and benefit these present-day descendants of the Bara-Balutedars.

**Implementing the Vision**

For smooth implementation, the Maharashtra State Skill Development Society (MSSDS) is registered as a "Training Partner (TP)" on both the Skill India Digital Hub (SIDH) and the PM Vishwakarma Portal. Currently, 391 PMGKVK Training Centres are operational on the PM Vishwakarma Portal, with an additional 64 in development. Furthermore, on February 1st, 2024, 101 new Skill Development Training Centres (70 PMGKVKs and 31 Government ITIs) were launched under the scheme.

**Quantifiable Success and Impact**

Over 200,000 candidates (239,277) have registered for the PM Vishwakarma scheme, with 27,000+ candidates successfully verified at level 3. Verification for the remaining candidates is ongoing. To date, 2,888 candidates from 19 districts have enrolled in skill training, with 1,831 successfully certified in various trades like tailoring, barbery, masonry, carpentry, and cobbling. MSSDS aims to provide skill development training to 10,000 *Vishwakarmas*, by March 2024.

**Be a Part of the Movement!**

If you are a skilled artisan in Maharashtra, this program can empower you to take your skills to the next level. Visit the Maharashtra State Skill Development Society (MSSDS) website or your nearest PMGKVK training center to learn more and register. Together, let us build a skilled and empowered future


## Nidhi Chaudhari (IAS)

Commissioner, Skill Development, Government of Maharashtra


Ms. Nidhi Chaudhari is a Maharashtra cadre IAS officer, 2012 batch. She is currently working as the Commissioner for Skill Development with the Government of Maharashtra. Prior to this role, she has also worked as the District Magistrate for Raigarh and Mumbai Suburban District, and Joint Commissioner for BMC and GST, Mumbai. Apart from public service roles, Ms. Chaudhari also contributes to the larger discourse on skill development as a motivational speaker and writer.

# AGNIPATH SCHEME: INSPIRING SKILLING AND PARTICIPATION IN THE ARMED FORCES


The **Agnipath Scheme** was launched on June 14, 2022, to engage and inspire the Indian youth to serve in the Armed Forces. Under this initiative, young individuals, both male and female will be selected in the 'below officer's rank' cadre of the 3-Armed Forces for a period of 4 years as *Agniveers*.

The *Agnipath* scheme holds significant importance in realizing the vision of building a self-reliant and empowered India. It offers a unique opportunity for the youth to fulfil their aspirations of joining the Armed Forces and contributing to the nation's defence. Moreover, it aims to empower, instil discipline, and imbibe military ethos among the youth, thereby enhancing their preparedness to face the evolving global challenges.

Candidates aged between 17.5 to 21 years are eligible to apply for the scheme. Upon selection, *Agniveers* undergo comprehensive basic military training, specialized trade training, and up-skilling courses as required. Furthermore, the Government of India will extend full support to *Agniveers* to facilitate their smooth transition into civilian life post completion of the 4-year *Agnipath* journey, ensuring they find gainful employment in the civilian sector.

In essence, the *Agnipath* scheme not only provides a platform for youth to serve the nation but also equips them with valuable skills and opportunities for a successful future beyond their military service.

**Inter-Ministerial Collaboration to Facilitate Education of Agniveers While in Service**

The Ministry of Defence (MoD), Ministry of Education (MoE), and all the three-Armed Forces have signed Memorandums of Understanding (MoUs) with various stakeholders to facilitate continued education of Agniveers while serving in the Armed Forces.

Through MoUs with the National Institute of Open Schooling (NIOS) and Indira Gandhi National Open University (IGNOU), *Agniveers* will receive appropriate certifications, including Class 12$^{th}$ certificates and bachelor's degrees.

**Inter-Ministerial Collaboration to Facilitate Awarding of Skill Certificates to Agniveers**

The Ministry of Defence (MoD), Ministry of Skill Development and Entrepreneurship (MSDE) and all the three-Armed Forces have signed MoUs to facilitate award of National Skills Qualifications Framework (NSQF) aligned skill certificates in accordance with their expertise/experience.

In this direction, MoD, MSDE and MoE worked together to create innovative solutions and opportunities for the Agniveers. It is envisioned that the Agniveers, on their exit from the armed forces, will be provided with skill certificates based upon their qualifications, trade, work experience, and learnings gained during the four years.

Additionally, Directorate General of Training (DGT) under MSDE would also facilitate award of National Trade Certificate (NTC) to Agniveers, for which a flexi MOU has been signed between the Armed Forces and DGT.

A special provision has been made by the Government to


incentivize and encourage the eligible ITI pass-out candidates by allotting bonus marks while applying for Agniveers in technical trades.

**Recognition as Awarding Body (AB) and Assessment Agency (AA)**

National Council of Vocational Education and Training (NCVET) has recognized 19 Institutions of the Tri Services of India i.e. Indian Navy, Indian Air Force, and the 17 Directorates of the Indian Army as an Awarding Body (Dual Category) and formally affiliated these institutions to the skill ecosystem of MSDE and NCVET under the project Punah Sthapan.

Further, to finalize the implementation of the scheme, several discussions were held involving various stakeholders; MSDE, MoD (concerned divisions of Indian Navy, Army, and Air Force), NCVET, UGC, DGT, NSDC, SSCs, IGNOU, Skill Universities, etc.

**Awarding of NSQF Aligned Skill Certificates**

ln order to provide skill certificates to the Agniveers, it was important to recognize and map the trades in the armed forces with the National Occupational Standards (NOS). ln this regard, MSDE constituted three working committees, one each for the three-armed forces: Indian Army, Indian Navy, Indian Air Force. These committees are comprised of members from MSDE, NCVET, DGT, Ex-Defence personnel working in the skill domain, NSDC, and Sector Skill Councils (SSCs).

The committees studied and analysed the skills acquired by the Agniveers during their training and deployment in the 4-year defence services tenure. The relevant sectors and corresponding SSCs were identified to take up the task of mapping skills with NOS.

The Armed force personnel were then onboarded on the National Occupational Standards. Several workshops were conducted in which the defence personnel, SSC representatives, domain experts, and committee members participated to study and map the 123 trades with the NOSs. The NOSs are developed as per the industry requirements.

The NCVET recognized Awarding Bodies (Indian Airforce, Indian Navy and 17 directorates of Indian Army) then developed NOS-based qualifications, which are NSQF aligned and approved by the National Skills Qualification Committee (NSQC), the apex committee housed at NCVET. Presently, a total of 225 Qualifications of the 3-Armed forces (174 for the Army, 44 for the AirForce, and 7 for Navy) have been approved by the NSQC. Based on these qualifications, market-ready and industry-accepted, *Kaushal Praman Patra* will be issued to Agniveers at the time of their exit from the Armed Forces. This would help the Agniveers become employment and civil-life ready at the time of exit.

**Onboarding on the Skill India Digital Hub (SIDH)**

NSDC also conducted orientation sessions on the Skill India Digital Hub (SIDH) for the Army, Navy, and Air Force personnel. This initiative aimed to introduce defence personnel to opportunities for upskilling and finding relevant job prospects in various industries. The session highlighted how SIDH could serve as a key resource for service members transitioning to civilian careers, offering them access to a wide range of courses and skill development programs. This collaborative effort underscores the commitment to supporting our nation's protectors in their journey towards professional growth and adaptability in the ever-evolving job market.

Further, solutions and functionalities are being worked upon, for issuing the *Kaushal Praman Patra* through the SIDH platform to *Agniveers* at the time of exit from the service. Additionally, the *Agniveers* will also get an opportunity to avail NSDC JobX functionality, which aggregates the jobs and connects the job seekers and various recruiters.

**Deepti Saxena**

VP, Standards, Content & Education Partnership, NSDC

Deepti Saxena has 28+ years of experience in various fields such as, Project Management, TVET, Occupational Standards, Frameworks, Curriculum & Content Development, Research, Training Center Management, and Capacity Building. This article was supported by Mr. Neelabh Sangal, Deputy General Manager (DGM), Standards, Content & Education Partnership, NSDC.

# THE NANDURBAR STORY: HOW AN ASPIRATIONAL DISTRICT BECOMES AN INSPIRATION FOR THE COUNTRY

**Introduction**

A small district in the North-West corner of Maharashtra, Nandurbar, stands as a testament to resilience and aspiration. Since its inclusion in the Aspirational Districts Programme launched by the Government of India in January 2018, Nandurbar has made many significant strides in its socio-economic development. Under this programme, 112 districts were identified as regions with potential for transformation through a comprehensive approach, encompassing vital sectors such as health, education, agriculture, and water resources.

To explore the story and on-ground realities of Nandurbar, the Research and Impact team at NSDC (National Skill Development Corporation) recently embarked on a journey to the district and conducted a field study to understand the factors that contributed to this transformation. This visit confirmed the importance of skill development, entrepreneurial spirit, and community support on the road to socio-economic development. This article captures some of the highlights of their journey and the inspirational stories our team got to hear in Nandurbar. Their insights will soon be published in a forthcoming in-depth report currently being developed by NSDC.

Rich in cultural diversity, Nandurbar is a mosaic of vibrant traditions and customs. At its core, the district boasts a tapestry of tribal communities, including the *Bhil, Pawara, Mavachi,* and *Kokna,* comprising a significant 45.6% of the population. These indigenous groups, with their unique languages and traditional practices, carry the legacy of a rich cultural heritage, of art, music, and dance forms.

**Challenges in Nandurbar**

Nandurbar's journey of progress hasn't been without roadblocks and complex challenges. From geographical terrain causing accessibility and connectivity issues to seasonal challenges such as heavy rainfall and flooding causing migratory issues, the district faces significant challenges in sustaining agriculture for the long term and identifying livelihood opportunities for its tribal community. Despite the implementation of integrated farming and livestock initiatives, lack of marketing linkages hinders the sustainability of small-scale enterprises. Intermediary organizations often exploit beneficiaries by purchasing their products at low prices and reselling it for profit without sharing a fair share of the profit to producers who are mostly women operating via community-led Self Help Groups (SHGs).

Notably, *Maalpada* and *Akkalkuwa* villages, located in the hilly terrain and home to prominent tribal communities like *Bhil, Kokni,* ST, and SC, possess abundant natural resources. But these areas lack digital connectivity, road connectivity, hospitals, and other modern amenities. This creates further complications, particularly for the youth in Nandurbar, in terms of their access to good education, skill development and livelihoods opportunities.

Nandurbar has been consistently leveraging community organizations to overcome some of these challenges to create and sustain livelihoods opportunities. Government organizations such as Krishi Vigyan Kendras (KVKs) play an instrumental role in this community by mobilizing and empowering local communities like *Gats* by providing training, technical assistance, and access to non-agrarian livelihoods such livestock rearing, thereby enhancing their resilience and income potential.

**From running a Chai Stall to becoming an Agripreneur**


Harish Chaudhari's Agripreneur Journey

Harish Chaudhary, from *Khanbara* village in Nandurbar, started with a humble tea stall as his only income source. Realizing the potential of dairy products in his business and the lack of local sources in his village, he decided to venture into dairy farming. With guidance from the Krishi Vigyan Kendra Nandurbar team, he underwent training and visited dairy farms in Anand, Gujarat, in 2009.

In 2014, Harish established his dairy farm on a 12-acre plot. Initially focusing on cultivating fodder due to limited resources in Nandurbar, he gradually expanded his livestock, starting with one cow and five buffaloes. Through additional training sessions at the KVK Centre, he improved his farming skills.

Expanding his herd, Harish acquired 25 hybrid cows from Punjab and another 25 from Gujarat, reaching a total of 100 animals. His annual income from dairy farming now exceeds ₹1.2 million, supplemented by fodder cultivation and a vermicompost unit for land fertility.

Involving 13 family members, Harish integrated his dairy farm's milk into his brother's tea stall business. Collaborating with agricultural departments, he explored opportunities to expand his dairy production into an enterprise.

Supported by Krishi Vigyan Kendra, Yojak, and District Administration, Harish conducted awareness sessions for farmers in Nandurbar, sharing his knowledge and contributing to capacity building in the region.

Harish's journey showcases his determination to overcome challenges, turning his tea stall setback into a thriving dairy enterprise, inspiring others in the region.

**Krishi Vigyan Kendra: Building Community Trust to Enable Transformation**

One of the biggest on-ground implementation challenges faced by any governmental programme or policy intervention is getting the community buy-in for the proposed changes. Policy implementation success requires on-ground mobilization and participation from the beneficiaries, and this is best achieved through trust and consensus building over time. This necessitates the presence of an anchoring agency on ground that is committed to doing the complex work of trust-building and awareness generation amongst the beneficiaries.

According to feedback from respondents in Nandurbar, the Krishi Vigyan Kendra (KVK) has been consistently fulfilling its role effectively on the ground. During numerous discussions with farmers, agricultural workers, and entrepreneurs in the region, our team discovered that the KVK is widely regarded as a dependable ally and advocate for their welfare. As a constituent of the National Agricultural Research System (NARS), the KVK in Nandurbar is dedicated to advancing agricultural technologies, providing training to farmers and extension workers on the utilization of modern agricultural practices, and fostering the capacity development of farmers to enrich their understanding and proficiency in integrated agricultural techniques.

By equipping them with knowledge and tools for success, KVK catalyses economic empowerment and income generation within the agricultural sector.

**Key Initiatives implemented by Krishi Vigyan Kendra in Nandurbar District**

- **Innovative Farming Techniques:** KVK equips farmers with cutting-edge cultivation methods such as multi-cropping to boost agricultural productivity and sustainability.
- **Tailored Training Initiatives:** Through partnerships with institutions like Mahatma Phule Krishi Vidyapeeth Agriculture University, the Horticulture Department, and NABARD, KVK conducts specialized training programmes spanning 32 hours across 22 days. These sessions cater to diverse groups including farmers, rural youth, women's associations, and agricultural officials, focusing on hands-on skill enhancement.
- **Personalized Farmer Support:** KVK provides personalized assistance to farmers, guiding them in the practical implementation of training methodologies within their farming practices.
- **Empowering Tribal Communities:** Recognizing the pivotal role of tribal communities like the Bhil Hindu and Kokani groups in Nandurbar's agriculture ecosystem, KVK offers specialized support and guidance, particularly in livestock management, to enhance their farming endeavours.
- **Support in Hilly Terrain:** In the hilly regions of Nandurbar, KVK extends its assistance to farmers cultivating crops like millets and maize, while also promoting alternative livelihood opportunities such as Mahua flower cultivation and pickle making post-harvest.
- **Diverse Training Approaches:** KVK adopts a multifaceted approach to training, combining on-campus sessions with practical on-field demonstrations. This hands-on approach enables farmers to gain valuable insights and experience through field visits and exploratory sessions.
- **Facilitating Re-Migration:** Addressing the needs of re-migration, KVK offers comprehensive support focusing on agriculture, allied activities, and horticulture training under projects like *Wadi*. Practical sessions and field visits are integral to these programmes, facilitating skill development and sustainable livelihoods in Nandurbar.

KVK's impact goes beyond agriculture, reaching into allied sectors and community development endeavours. Through programmes diversifying livelihoods, it encourages rural youth and women to explore opportunities in animal husbandry, horticulture, fisheries, and agro-processing. This reduces dependence solely on agriculture and promotes inclusive growth.

Moreover, KVK actively supports entrepreneurship by offering training in agribusiness management and facilitating market access for rural entrepreneurs. By nurturing local talent and creating an enabling environment for enterprise, KVK boosts local economies and contributes to sustainable development.

**Leveraging Skills Development to Build a Thriving Seeds Enterprise**

Inspiration for the Country

Agripreneur

Anil Patel, a resident of Vavad village in Nandurbar, faced challenges in pursuing his passion for agriculture due to limited resources. However, his journey took a positive turn when he got a job at Mahiko Seeds in Surat. There, he learned about seed production and agricultural techniques. He further developed his skills focusing on cultivating vegetables, flowers, and other crops.

In 2005, Anil returned to his village with newfound knowledge and discovered opportunities provided by Krishi Vigyan Kendra (KVK) training programmes. Inspired, he started poultry farming but later shifted to seed production with guidance from KVK. He initially cultivated 10 thousand tomato seeds and later expanded into chili seed production, forming partnerships with agriculture departments.

With KVK's support, Anil established a small seed production unit on his land, expanding it gradually. He bought 5 acres of land with a ₹1.1 million loan to set up seed processing units. His business flourished,

seed processing units. His business flourished, producing high-quality seeds for markets in Surat, Nashik, and Nandurbar.

Anil's success earned him recognition from state and district governments for enhancing seed production in Nandurbar. His family actively supports his venture, contributing to the cultivation of 100 million seeds annually.

With an annual income of ₹600,000 to ₹700,000, Anil streamlined a robust supply chain model, ensuring timely production according to climatic conditions. His dedication and visionary approach have made him a respected figure in Nandurbar, inspiring farmers across the region.

**The Role of Government Schemes in Development of Nandurbar**

In Nandurbar district, several schemes are being implemented to address various socio-economic needs and improve the quality of life for rural communities. These include the Pradhan Mantri Gram Sadak Yojana (PMGSY), which aims to enhance road connectivity in remote areas, and the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), providing wage employment to rural households. The National Rural Livelihood Mission (NRLM) promotes self-employment and entrepreneurship opportunities, while the Pradhan Mantri Awas Yojana (PMAY) focuses on providing affordable housing. These schemes play a vital role in addressing developmental challenges and improving livelihoods in Nandurbar district.

The NABARD *Wadi* Project is a notable initiative focused on sustainable agriculture, livelihood improvement, and uplifting rural communities' socio-economic status. Supported by the National Bank for Agriculture and Rural Development (NABARD), this project emphasizes agroforestry-based livelihood models called *Wadi* systems. These systems encourage small and marginal farmers to cultivate fruit-bearing trees like mango, guava, and custard apple alongside economically viable crops such as pulses and vegetables in an integrated manner. The Wadi approach not only diversifies income sources but also enhances soil conservation, water management, and environmental sustainability.

Moreover, the project includes capacity-building components like training sessions on modern agricultural practices, financial literacy, and market linkages. This empowers farmers to utilize their resources effectively and increase yields. By promoting agroforestry and empowering rural communities, the NABARD *Wadi* Project significantly contributes to sustainable development and enhances farmers' well-being in the Nandurbar district.

**Way forward**

The journey of innovation in Nandurbar, supported by Krishi Vigyan Kendra, Yojak, and other civil organizations, has sparked significant awareness and community involvement. They have focused on integrated farming and livestock management, actively engaging local and tribal communities in village development and livelihood improvement.

Looking ahead, the initiative in Nandurbar aims to enhance market connections for self-help groups (SHGs) and tribal communities. This involves promoting and selling their products through effective marketing and branding strategies. Additionally, these communities have participated in programmes related to integrated farming, livestock management, and diverse cropping practices.

While Nandurbar has made several impressive strides in its own development journey, the mission of aspirational district is far from complete. As the technological, skills and livelihoods ecosystem goes through rapid changes globally, people of Nandurbar will require further support and empowerment to sustain the growth and generate more avenues of livelihood opportunities for the youth in Nandurbaar. Some of these areas of growth include:

- **Establishing a Marketing and Networking Ecosystem** that promotes livelihood opportunities for tribal community development through effective marketing strategies.
- **Enhancing Interdependence in the Delivery Chain** to expand the market share of SHG products and services by creating direct marketing linkages and bypassing intermediaries. This ensures a "profit for all" model fostering meaningful impact for local communities.
- **Training for Product Development and Financial Literacy** to empower the budding agri-preneurs with mechanisms for packaging, pricing, and costing. This also includes developing financial literacy programmes for SHGs, especially women, to ensure they have a clear understanding of pricing structures and packaging systems, thereby empowering them in the marketing process.

The initiatives in Nandurbar emphasizes not only economic development but also stands as testament to the collective development drive within the residents and communities of Nandurbar who are charting their own journey of prosperity through initiative, positive outlook, and consistent effort against all odds.

**Monika Sharma**

Consultant, Research & Impact, NSDC

Monika Sharma, a skilled professional with 9 years of experience in the Education sector, specializes in ICT, Skill Development, CSR Projects, and Entrepreneurship project Implementation. With a Master's degree in social work (MSW) and research background, she excels in policy advocacy and framework development.

# TWIN ENGINES OF INDIA'S GROWTH STORY: INNOVATION AND ENTREPRENEURSHIP

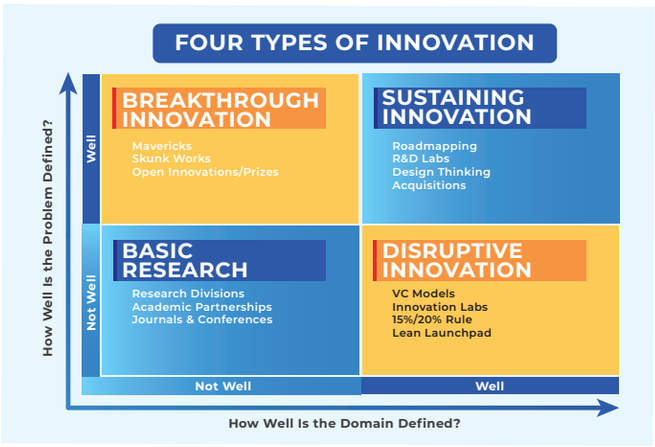
Entrepreneurship is a potent catalyst for economic growth and development. Interventions geared towards creating business friendly ecosystems also yield benefits for job creation and promote a prosperous and inclusive society where everyone can potentially access opportunities for upward mobility. Beyond starting a new business, to generalise, entrepreneurs innovate and create new possibilities for the whole society.

Innovation is the key differentiator for entrepreneurs as their success is contingent on solving an existing problem in society through creative problem solving. Armed with this resource, entrepreneurs either create or mobilise other resources with a new capacity to produce wealth. Innovators suffuse untapped resources with economic or social value to fully realise them into resources with enhanced wealth-producing potential. Until the culmination of this circuit, every mineral is just another rock.

The natural synergies between innovation and entrepreneurship drive economy and society through purposeful interventions. While innovation improves technology and generates new ideas and methods for implementation; entrepreneurship entails taking calculated risks to identify opportunities for engineering new ventures. Innovation is the launch pad of ideas and entrepreneurship brings its to a logical conclusion by introducing it to the market. Both, therefore, are dependent on each other for realisation of their raison d'être.

In the 21st century, upgradation to resilient and sustainable technologies is the fundamental impulse that keeps the innovation engine moving. In fact, today, industry and innovation are uttered in the same breath, as referenced in the United Nations Sustainable Development Goal 9 (Industry, Innovation, and Infrastructure). According to an article published by Greg Sattel in Harvard Business Review in 2017, Innovation can be further simplified into 4 types:

- **Sustaining Innovation:** That which seek to improve already existing technologies, with a clear understanding of the problems that need solving.
- **Breakthrough Innovations:** That which offer unconventional solutions to well-defined, hard-to-solve problems.
- **Disruptive Innovation:** That which alters the basis of competition and change what constitutes 'good practice'.
- **Basic Research Innovations:** That which helps define the problem and discover domains of skills that can resolve the problem.



With innovation as the mainspring of entrepreneurship, both complementarily drive economies. Therefore, business and government environments must be receptive of innovation to realise the gains of entrepreneurship.

**Indian Policy Praxis in Entrepreneurship**

Entrepreneurs are at the core of nation-building through their significant contribution to economic development. Instituting a governance paradigm that recognizes and upholds the sanctity of the symbiosis between innovation and entrepreneurship is central to a positive business environment.

Business in India has recorded an impressive upward trajectory, with booming entrepreneurship and innovation at the heart of it. Recent quantitative endeavours and assessments attest to this feat; India registered a quantum jump in its ranks in the Global Entrepreneurship Monitor 2023-24 Report, from 16th to 2nd. The report brought out jointly by Babson College (USA) and London Business School (UK) pegs India as one of the best places among 49 countries globally to start a business. India also ranked 40 (of 132 countries) in the Global Innovation Index 2023.

This accolade is a dividend of cohesive policies geared at the transformation of India's business environment. It shines light on the success of schemes such as Atal Innovation Mission, Start-Up India, and eBiz Portal among others and the overall lifecycle approach of the contemporary policy landscape.

Starting at an early age, Atal Innovation Mission is cultivating a problem-solving mindset and nurturing an ecosystem of entrepreneurship at universities. At the school-level, Atal Tinkering Labs are fuelling the curiosity of young minds through state-of-the-art laboratories. The Atal Innovation Mission concurs with the letter and spirit of the National Education Policy (NEP, 2020). NEP 2020's explicit thrust on fostering creativity and critical thinking in the education system lays an unassailable foundation for innovation in the school-going and school-leaving years.

Outside the school, Indians with an innovative bend of mind and entrepreneurial acumen are being supported with innovative financing efforts. The Startup India Seed Fund Scheme provides financial assistance against proof-of-concept, prototype development, product trials and commercialisation. PM Mudra Yojana spurs entrepreneurial aspirations and expands business activities by extending collateral-free loan to Small/Micro enterprises and individuals in the non-agricultural sector.

Completing the life cycle, entrepreneurs are supported through market linkages and digitalization of marketplaces. Government e-Marketplace (GeM) provides a digital platform for procurement of services by leading Government buyers. GeM makes special provisions for a procurement quota (25%) of Small and Micro Enterprises (SMEs).

Sustained entrepreneurial zeal is ensured through capacity building initiatives, over and above the lifecycle approach. Skill India Digital Hub (SIDH) launched by the Ministry of Skill Development and Entrepreneurship (MSDE) revolutionises lifelong learning among existing and aspiring entrepreneurs with its digestible learning modules and augmented user experience. PM Vishwakarma provides Basic Training to artisans and craftspeople to contemporise their knowledge, paving a ready path for entrepreneurial ventures.

Policy interventions are carefully addressing the evolution of businesses—from ideation to maturation. This finds resonance in the gamut of schemes under Atal Innovation Mission. Atal Incubation Centres, for example, enable entrepreneurship by providing technical facilities, resource-based support, mentorship, and co-working spaces.

For rural entrepreneurs, the ASPIRE scheme (A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship) aims to accelerate entrepreneurship in the agro-industry through a network of technology centres and incubation centres. GeM includes a special procurement quota of 4% from MSEs owned by Scheduled Castes/Scheduled Tribes entrepreneurs and 3% from MSEs owned by Women entrepreneurs.

Entrepreneurship shares a deep kinship with the health of the entire macro economy. Entrepreneurship raises the productivity of firms by intensifying competition and accelerates structural change by replacing non-performing establishments. Even the most mundane, ordinary vendor is forced to innovate to keep up with game-changing entrepreneurs. It is imperative, hence, to sustain a favourable policy and investment climate for aspiring entrepreneurs.

**Shift to Solopreneurship**

Solopreneurs represent an up-and-coming discursive category of individuals independently managing, organizing and assuming the risks and modalities of a business. Solopreneurs do not hire employees and share a larger share of the earnings' pie. As doing a business at scale requires significant initial capital and labour inputs, entrepreneurship was often seen as an unfeasible livelihood pathway for many. However, the shift towards solopreneurship, removes this roadblock by providing

viable avenues to run a business without a heavy initial investment.

Solopreneurs, especially in the urban context, are mostly identifiable by their work in freelancing, consulting, or web-based industries. This includes businesses offering services on the cloud such as cloud kitchens, website design, video editing, tutoring, content writing etc. Solopreneurs represent the epitome of a scrappy, and creative outlook that is essential to the entrepreneurial spirit.

This is not to say that solopreneurship is a new development. While the coinage is new, the phenomenon is well-established. Roadside shoe repair booths or non-descript tailoring stations represent a long-standing tradition of self-run businesses that have catered to a variety of services required in the society. That said, the body of literature on solopreneurship is comparatively under-developed.

According to the Periodic Labour Force Survey (PLFS) 2022-23, 39% of workers were self-employed as *own account workers* who do not hire any employee. This cohort is a substantial revenue generator for the economy, contributing to national production and income figures. On the other side, solopreneurs also hold within them an untapped potential to double as job creators and contribute to enhancement in household incomes, standards of living and consequently economic growth. For example, 18.3% of all workers in India are helpers in household enterprises, according to PLFS 2022-23.

India has curated an ecosystem of high-impact interventions for willing entrepreneurs to build and scale their businesses.

Policies have worked vigorously towards generating employment and improving employability in the past. They have pre-empted roadblocks in starting a business and attempted to create innovative solutions to support aspiring entrepreneurs. The onus now rests with our young and able demography to exploit the favourable entrepreneurial climate.

References:


- *Akhil Bhartiya Shiksha Samagam, Ministry of Education and Ministry of Skill Development and Entrepreneurship, 2023. Available at: https://www.education.gov.in/sites/upload_files/mhrd/files/nep/ABSS_Report_Session_5.pdf*
- *Satell, Greg, Harvard Business Review, 2017. Available at: https://hbr.org/2017/06/the-4-types-of-innovation-and-the-problems-they-solve*
- *Kritikos, Alexander, IZA World of Labour, 2014. Available at: https://wol.iza.org/articles/entrepreneurs-and-their-impact-on-jobs-and-economic-growth/long*
- *Ministry of Statistics and Programme Implementation (MoSPI), Government of India, 2023. Available at: https://www.mospi.gov.in/sites/default/files/publication_reports/AR_PLFS_2022_23N.pdf?download=1*
- *Kim, Jungsuk, et al., Asian Development Bank, 2022. Available at: https://www.adb.org/sites/default/files/institutional-document/826606/adou2022bp-entrepreneurship-economic-growth.pdf*



**Nidhi Sharma**

Former Consultant, NSDC

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# TOWARDS A BRIGHTER FUTURE: INNOVATION AND AI IN THE EDUCATION SECTOR

In a world where the fast-paced evolution of technology continuously redefines the boundaries of what's possible, education remains the unwavering cornerstone of progress and prosperity. As per the World Economic Forum's Future of Jobs Report 2023, the top 10 fastest growing jobs in the next 5 years are AI and Machine Learning Specialists, Sustainability Specialists, and Digital Transformation Specialists. The question is: if these are the fastest growing jobs, how do we as a population prepare ourselves for them? The report suggests that 3 out of 10 of the largest growth jobs are related to the education sector. This essentially means that to upskill the labour force for the changing landscape of jobs and employment, the education sector will see huge growth. At the same time, one may contemplate how prepared the education sector is for such shifts. Are they evolving and innovating as per the changing times?

Within this dynamic landscape, many entrepreneurs and private organizations have been creating innovative solutions to solve for access to quality education at scale. One such example is NewGlobe[1], a private organization supporting several national and state level governments in reshaping public education systems in India and Africa.

**Fastest Growing Vs. Fastest Declining Jobs**

| | Top 10 fastest growing jobs | | Top 10 fastest declining jobs |
|---|---|---|---|
| 1. | AI and Machine Learning Specialists | 1. | Bank Tellers and Related Clerks |
| 2. | Sustainability Specialists | 2. | Postal Service Clerks |
| 3. | Business Intelligence Analysts | 3. | Cashiers and ticket Clerks |
| 4. | Information Security Analysts | 4. | Data Entry Clerks |
| 5. | Fintech Engineers | 5. | Administrative and Executive Secretaries |
| 6. | Data Analysts and Scientists | 6. | Material-Recording and Stock-Keeping Clerks |
| 7. | Robotics Engineers | 7. | Accounting, Bookkeeping and Payroll Clerks |
| 8. | Big Data Specialists | 8. | Legislators and Officials |
| 9. | Agricultural Equipment Operators | 9. | Statistical, Finance and Insurance Clerks |
| 10. | Digital Transformation Specialists | 10. | Door-To-Door Sales Workers, News and Street Vendors,and Related Workers |

Source
World Economic Fourm, Future of Jobs Report 2023.

Note
The jobs which survey respondents expect to grow most quickly from 2023 to 2027 as a fraction of present employment figures

**Fastest Growing Vs. Fastest Declining Jobs**

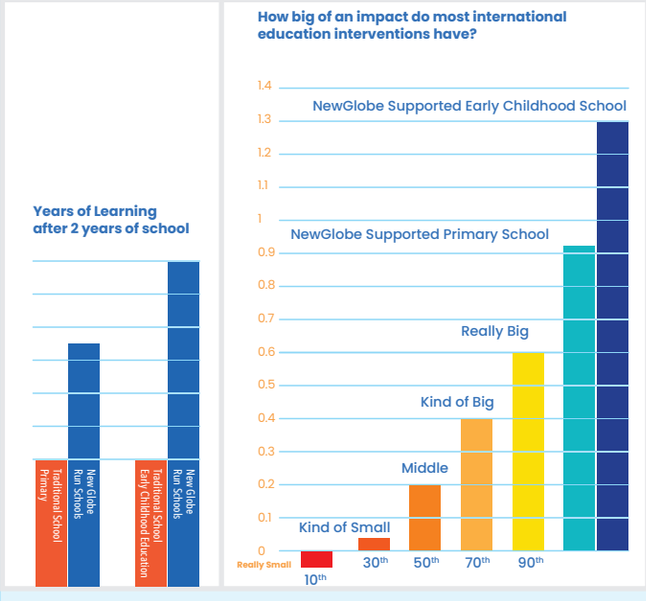
| | Top 10 Largest Growth Jobs | | Top 10 Largest Declining Jobs |
|---|---|---|---|
| 1. | Agricultural Equipment Operators | 1. | Data Entry Clerks |
| 2. | Heavy Truck and Bus Drivers | 2. | Administrative and Executive Secretaries |
| 3. | Vocational Education Teachers | 3. | Accounting, Bookkeeping and Payroll Clerks |
| 4. | Mechanics and Machinery Repairers | 4. | Security Guards |
| 5. | Business Development Professionals | 5. | Building Caretakers and Housekeepers |
| 6. | Building Frame and Related Trades Workers | 6. | Cashiers and Ticket Clerks |
| 7. | University and Higher Education Teachers | 7. | Material-Recording and Stock-Keeping Clerks |
| 8. | Electrotechnology Engineers | 8. | Assembly and Factory Workers |
| 9. | Sheet and Structural Metal Workers, Moulders and Welders | 9. | Postal Service Clerks |
| 10. | Special Education Teachers | 10. | Bank Tellers and Related Clerks |

Source
World Economic Fourm, Future of Jobs Report 2023.

Note
The jobs for which employment figures are expected to increase or decrease most quickly in real terms from 2023 to 2027 when survey responses are normalized to labour-market statistics from ILO.

**NewGlobe: Innovation at Scale to Transform Public Education at Scale**

NewGlobe for more than a decade, has been supporting visionary national and state governments across the globe, in transforming public education systems. NewGlobe offers governments 360-degree support by providing scientifically designed instruction materials, assisting with the implementation process, training support, and tech support. Operational across Africa, South Asia, and America, and reaching more than 1.9 million children, it complies with the Ed-Tech principles of the World Bank. It provides core hardware and digital learning platforms conducive to low-infrastructure environments. Additionally, its research engine is capable of processing up to 1 billion data points! NewGlobe's end-to-end service approach has yielded remarkable results.




An academic study[2] conducted by 2019 Nobel Prize-winning economist Professor Michael Kremer into NewGlobe's methodology in Kenya underscores the organization's capability to produce some of the most significant learning gains ever recorded in emerging markets. The study reveals that in early childhood development (ECD) programs, pupils gain nearly a year and a half of learning. This is equivalent to a 1.35 standard deviation. For primary grades, it is 0.81 standard deviation. These gains represent a profound shift in the educational landscape, with the potential to bring children from underserved communities on par with their counterparts in more affluent nations. Additionally, this substantiates that standardization in lesson plans and execution strategies has the potential to provide path-breaking learning gains at scale. NewGlobe is committed to the science of learning. Its programming is grounded in data-driven methodologies, ensuring that the educational experiences it crafts are not only effective but

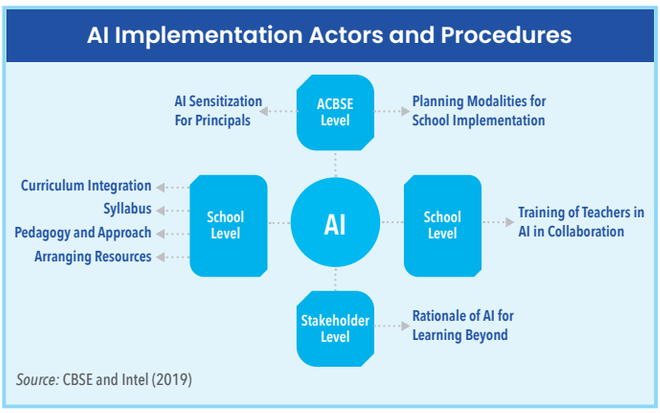
also constantly evolving and improving. It supplements government curriculum courses with core learning content designed on the principles of Direct Instruction[3]. It offers tech-enabled at-home learning materials, as well as vocational training materials. At the heart of its mission is a profound understanding that education is the bedrock of a prosperous, equitable, and peaceful society.

**AI for Educational Content Creation at Scale**

AI became the buzzword of 2023. Many speculations started with its open availability on the internet in the form of various generative AI platforms. Some suggested coding jobs will become redundant. Some even feared the loss of creativity and original thinking. In the past year, this initial fear has somewhat gone down. Businesses have embarked on the journey of creating their own in-house generative AI technology, as it presents the potential to work at scale in a considerably shorter amount of time.

A common apprehension surrounding AI is the perceived threat to jobs. However, the essence of leveraging AI in education, especially in content creation, is not about replacing human roles but about aiding them. As the adoption of technology increases, 50% of all employees will need reskilling by 2025 (Future of the Jobs Report, 2023). Pew Research Center and Elon's Imagining the Internet Center researched the likely future of workplace training in 2016. Many experts surveyed for this research expected the education marketplace to innovate at an accelerated pace in the coming years. Some predicted training at the workplace by the employee. Many also predicted a huge investment in self-training by individuals to enhance their skills and adapt as per the market needs. AI, of all the recent technologies, has intrigued businesses, educators, policymakers, and researchers the most.

The sixth edition of the AI Index Report released by Stanford University highlights that in 2022 the amount of private investment in AI was 18 times greater than it was in 2013[4]. In the field of education, many governments are endorsing AI curricula. In India the launch of National Education Policy (NEP), 2020 led to the Central Board of Secondary Education (CBSE) announcing AI as an optional subject in more than 22,000 schools, to ensure that future citizens of India understand AI and can deploy it to address local and global problems[5]. The curriculum focuses on 'learning through doing' and provides opportunities for students to learn AI by using it to build solutions to community challenges (CBSE, 2020).




*Source:* CBSE and Intel (2019)

Consequently, people working in the education sector and curriculum-based content creation must be well-versed and equipped to make content as per the updated curriculum needs. And that too in a fast-paced manner to capture the market at the right time. Generative AI can significantly reduce the time taken for standardized, quality education content at scale if provided with highly specific and guided instructions. Hence, AI can be a helpful tool but one must be skilled to fully utilize its potential.

**Training AI: A Necessary Skill Soon**

We all have heard stories from our elder generation about how computers changed the world landscape. As a result, they had to adapt to it to stay relevant. Countries including India actively moved to tech-based problem-solving for complex issues such as corruption (digital payment methods such as UPI), financial inclusion (bank accounts for women and the marginalized for direct benefit transfers), and even education (online learning portals and computer-based exams).

Technology acts as a disruptor of the status quo. Just as with the previous waves of tech integration, AI should be viewed as another change, like moving from handwritten text to print or from print to the internet. Thus, equipping the current workforce with AI and other upcoming technologies is a necessary step to ensure employability in the coming years.

For the education sector businesses and consulting firms, the need is twofold. One, the content created for pupils using AI should be pedagogically sound, unique, and customized as per the geographical needs and pupils' learning levels. Two, the content team should be upskilled to leverage AI for content creation and product innovation. Content teams are often under-skilled in terms of technology and need to be trained, equipped, and enabled to maximize the benefits of technology such as artificial intelligence. This is where the gambit of prompt engineering comes into play.

Prompt engineering is a crucial step in making AI work for you. It means providing a specific set of text-based instructions to AI to generate the desired results. One must understand that AI is not a living and thinking individual. It does not understand scenarios like a human brain does. Instead, it digs out the available information from various sources and packages it as per the shared prompt. A well-engineered prompt can help you with the initial steps. But that, by no means, can be a replacement for human efforts. Fact-checking, creativity, originality, custom content, and research questions, continue to primarily be human roles. At the same time, it is essential to recognize that, despite its advanced capabilities, it does not possess true understanding or consciousness. Its responses are based on learned patterns from the training data (Marcus & Davis, 2019)[6].

The integration of AI in educational materials represents a significant leap forward. The use of AI in developing content at scale is not merely a technological showcase; it is a strategic move towards democratizing quality education. By leveraging AI, one can ensures that the learning materials are not only aligned with the national and state curriculums but also available in a quick time. It also shows readiness to provide services to policymakers on short notice. And eventually, to provide quality learning materials to pupils at an enhanced pace.

AI, with its myriad capabilities, offers a paradigm shift in how educational content is crafted. By leveraging generative AI technologies, we are now able to create tailored, high-quality educational materials at an unprecedented scale. This integration of AI in education creates a pathway for supporting innovation in skilling, livelihoods, and entrepreneurship development.

**Upskilling: A Non-Linear Approach**

Education policies in India before the NEP 2020 had a segregated approach i.e. after Grade 10 pupils were bracketed into three fields: science, commerce, and humanities. This put the non-STEM pupils in a disadvantageous position in terms of their readiness to adapt to technological advancements. This also led to the general state of being overwhelmed or lacking the skills required for high-paying jobs.

With NEP, 2020 emphasizing flexibility in choosing courses, vocational training, experiential learning, and cultivating critical thinking, the way curriculum is viewed, conceptualized, and created must take a non-linear approach. In this context, blending core curriculum content with 21st-century skills, practical opportunities and an early exposure and introduction to technology is the need of the hour.

On the front of employee upskilling, firms should invest in training their employees, especially the content/instructional design team to use generative AI at work. Employing innovative methods in creating learning materials can help firms provide customized instruction materials to multiple governments/stakeholders with varying academic needs and that too with a quick turnaround time.

To illustrate, let us consider the creation of a science textbook. Traditionally, this would involve a team of educators and editors and, may take 6-8 months, or even more, to create and vet one textbook. With AI, we can expedite this process and create the same textbook in about 2 months. This means in the same period, in place of 1, a team can create up to 3 textbooks, enhancing productivity and product completion by 3 times!

Another example is language learning and art creation. AI can assist in creating interactive language exercises and adapting to different dialects and cultural nuances. It can generate passage-based images with cultural context in seconds as opposed to hours. This is particularly beneficial when education firms are operating at scale in diverse geographical landscapes.

**Tech Integrated Education: A Vision of Empowerment**

Technology is evolving at an unprecedented pace. Innovation in education and upskilling are the needs of the hour. As per the ASER Report 2023, released in January this year, approximately 25% of the pupils aged 14-18 in rural India cannot read a Grade 2 text properly. More than 50% struggle with basic numeracy. However, more than 90% of the youth have at least one smartphone in the household, and they know how to use it[7].

This presents a huge opportunity for education service providers to bring a change. The incorporation of AI aligns with the broader goal of empowering populations through education. It is a tool that complements the efforts of educators, enabling them to focus on what they do best: teach, mentor, inspire, and bring change!

The expectations and exposure of young minds to the current world are starkly different from those of previous generations. As the pandemic hit, many began their schooling via online classes, completely deprived of a classroom experience. Many had a knee-jerk break in their schooling as they suddenly moved from a classroom learning method to online classes. The impact of the pandemic was particularly brutal for those who neither had access to technology nor had opportunities to learn at home. It is the latter group that requires accelerated learning opportunities, and AI can be a helpful aid in this process by speeding up the process of content creation. The gap is wide, and we must be prepared to fill it.

**References:**


1. *https://newglobe.education/home-page/*
2. *Guthrie Gray-Lobe, Anthony Keats, Michael Kremer, Isaac Mbiti, & Owen Ozier (2022) Can Education be Standardized? Evidence from Kenya*
3. *Direct Instruction (DI) is a highly structured teaching method characterized by a sequenced and systematic approach to instruction*
4. *Nestor Maslej, Loredana Fattorini, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Helen Ngo, Juan Carlos Niebles, Vanessa Parli, Yoav Shoham, Russell Wald, Jack Clark, and Raymond Perrault, "The AI Index 2023 Annual Report," AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, CA, April 2023*
5. *K-12 AI Curricula: A mapping of government endorsed AI curricula (UNESCO)*
6. *Marcus, G., & Davis, E. (2019). Rebooting AI: Building Artificial Intelligence, We Can Trust. Pantheon*
7. *Aser Report, 2023*



## Varsha Thakur

Deputy Managing Editor, NewGlobe

Varsha is an education sector professional, specialising in early childhood and primary education content for public schools in Africa and India. With an experience of catering to government programs and partnerships to deliver educational content using technology. She has a master's degree in International Relations from Jawaharlal Nehru University. She is passionate about transforming public education systems and creating an impact on scale.

# IN CONVERSATION

# LEADING THE DIGITAL REVOLUTION IN INDIA: SECTOR SKILL COUNCIL FOR IT-ITeS, NASSCOM

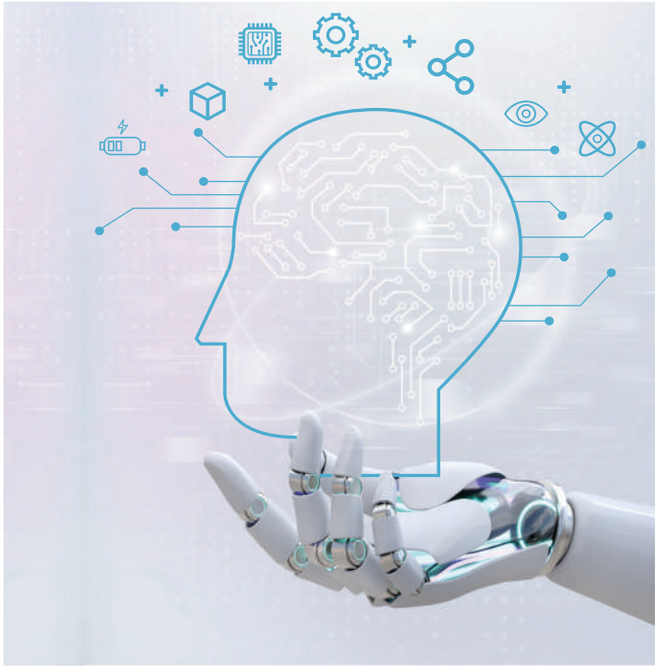

## Kirti Seth

*CEO (Chief Executive Officer), SSC IT-ITeS, Nasscom*

*Kirti Seth has rich experience in entrepreneurship, management and driving change. She is the CEO of the IT-ITES Sector Skills Council at Nasscom. SSC Nasscom has the honour of building and implementing FutureSkills Prime, India's Technology Skilling Hub, in partnership with MeitY Government of India. Her last role, before she transitioned from the corporate sector, was CEO of the NIIT-Genpact joint venture called NIIT Uniqua. She was also an advisor to Fortune 500 companies like Bank of America, Shell, Rio Tinto, and MetLife as part of NIIT's Global Consulting and Advisory practice.*

**Can you tell us a little bit about your personal career journey? How did you come into the role of CEO for SSC IT-ITeS, Nasscom?**

I stumbled into this role somewhat unexpectedly. After leading the NIIT Genpact joint venture, NIIT Uniqua, I decided to step back. About 1.5 years into my break, a former member of the board of NIIT Uniqua from Genpact, now a board member at Nasscom, bumped into me and invited me to join Nasscom, which was just beginning to delve into discussions on technology disruption and digital transformation. Nasscom had commissioned research on the impact of emerging technologies and decided to create a learning platform called Future-Skills to address it. Intrigued, I met with my friend and Debjani, who had also recently joined Nasscom as President. Despite my lack of tech background, I had years of experience in the training industry, having transitioned from finance to learning in 2003. I decided to give it a shot, and here I am, with Nasscom. Initially, I established the FutureSkills B2B platform exclusively for Nasscom member firms. Later, recognizing the broader impact of digital transformation, we launched FutureSkills Prime, funded by MeitY, to cater to all of India. Then 3 years ago, I took over as CEO of the Sector Skills Council.



**You are currently working in a leadership role at Nasscom. Would you like to share any important leadership lessons you have learned along the way?**

When working at a national level in India, the sheer scale of operations can be daunting, but it is essential not to be intimidated by the numbers. Instead, break down tasks and goals into manageable components and focus on tackling each one by the nature of the problem, not the size of the problem. Running a Sector Skill Council (SSC) differs significantly from managing a corporate organization where objectives are usually clear-cut, focused on profitability and efficiency. Joining an SSC, I realized the shift in priorities and the necessity to adapt to a different operational landscape. Unlike a typical business environment, an SSC operates within a broader ecosystem where we need to keep the bigger picture of the ecosystem in mind. This necessitates the ability to foster collaboration and navigate diverse perspectives. While my natural inclination is towards a data-driven, objective approach, I have learned the importance of not taking hard positions and finding ways to navigate through a large number of stakeholders. Effective communication, consensus-building, and knowing when to listen embracing these skills has been crucial in navigating the complexities of the SSC environment. And I continue to learn lessons even today.

**Tell us a little about the SSC you have been leading and its overall skills and livelihoods ecosystem. What are some unique aspects that set your sector apart from others?**

Serving as the CEO of the IT-ITES SSC amidst the current digital wave feels like a significant privilege. Digitalization is at the forefront of India's agenda, with ambitions to become a trillion-dollar digital economy and empower every citizen digitally. While the notion persists that every industry will become a tech industry eventually, the reality is that tech remains predominantly within the IT sector for now. However, there is a pressing responsibility to bridge this gap and ensure the broader ecosystem evolves inclusively.

Our challenge lies in transcending sectoral boundaries and fostering collaboration across industries. This demands a shift from vertical to horizontal thinking, acknowledging the interconnectivity between various sectors. Despite the desire for fluidity, the current structural setup remains rigid, emphasizing the need for reinvention.

The allure of the IT sector stems from its role as a gateway to white-collar employment, attracting aspirants from diverse backgrounds. From basic computer literacy to advanced skills like machine learning, IT encompasses a broad spectrum of competencies. Our role extends beyond conventional training; we act as facilitators, forging partnerships with state governments, educational institutions, and industries to bridge the skill gap effectively.

As a trusted intermediary between industry and academia, our significance has never been greater. Collaborating with policymakers, academia, and industry stakeholders, we facilitate the alignment of education with industry demands. The more we can align what industry demands are to what the supply side in academia provides and give feedback on policy changes that can enable the collaboration to thrive, the better we will be doing our job.

The government's emphasis on future skills underscores the urgency of our mission. As India is a leading export earner and a significant job provider, the IT sector's importance cannot be overstated. We carry a heavy responsibility.

**What kind of gaps have you noticed in terms of skill demand and skill supply in your sector? And can you share some initiatives taken by SSC IT-ITeS to bridge this gap?**

When considering the skills gap, it is evident that at the higher end, particularly with generative AI taking over more automated tasks, the gap widens significantly. Aspirational demand drives the upskilling efforts in these areas, but job growth does not match the pace of skill acquisition, leading to an imbalance. Conversely, at the lower end, where the tasks are more routine, the gap is not as pronounced due to the growing supply of skilled individuals.

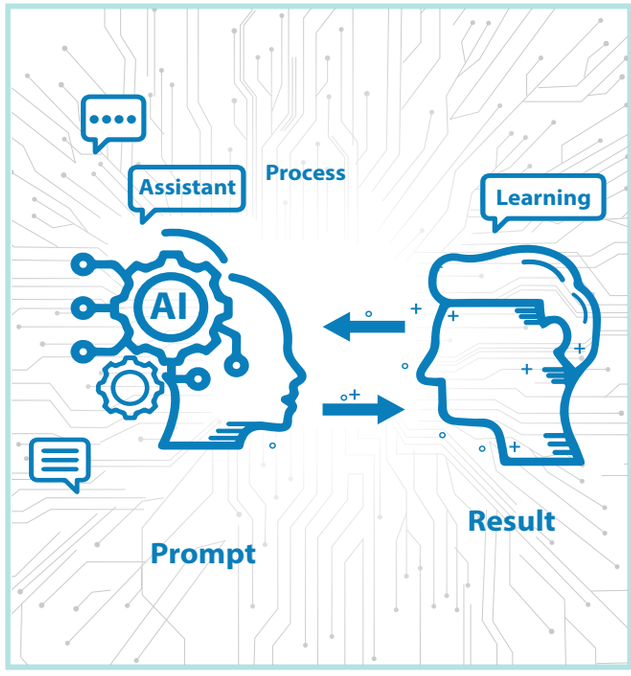
To bridge this gap effectively, fostering closer collaboration between academia and industry is paramount. One approach involves integrating industry-approved courses into the skilling ecosystem, ensuring that individuals receive certifications for skills already recognized by employers. Additionally, initiatives like the FutureSkills Prime Career Mantra series provide guidance on navigating today's rapidly changing job landscape, emphasizing the importance of acquiring essential skills like AI literacy and data proficiency.

It is crucial to dispel the fear of technology replacing jobs by emphasizing the need for individuals to adapt and work alongside advancing technologies. As technology evolves rapidly, relying on content curation rather than creation becomes essential to ensure relevant and up-to-date learning resources. Another significant initiative is promoting digital fluency, where individuals are encouraged to understand technology regardless of their technical background. Offering foundational courses on

> *"It is crucial to dispel the fear of technology replacing jobs by emphasizing the need for individuals to adapt and work alongside advancing technologies."*

topics like AI, blockchain, and cybersecurity helps build awareness and ensures that everyone is equipped to navigate the digital landscape.

By fostering digital fluency and aligning skill development with industry needs, we empower individuals to make informed decisions about their education and career paths, ultimately contributing to India's growth as a tech-savvy nation.




**We are currently on the cusp of what is popularly known as the 4th Industrial Revolution. Tell us ways in which technological and industrial advancements impact the Skilling Ecosystem for India?**

The overarching message is clear: technology is omnipresent and integral to every aspect of modern life. From entertainment to daily tasks like shopping and ordering food, technology permeates our routines. Understanding the basics of technology—like cloud computing, security measures, and recommendation algorithms—is essential for personal safety and efficiency.

Moreover, embracing technology is crucial for professional success. Those who adeptly utilize tools like Excel functions or AI-driven assistants gain a competitive edge in productivity and effectiveness. Even without coding expertise, grasping the logic behind it fosters analytical thinking, problem-solving, and mathematical skills, all of which are invaluable in today's digital landscape.

Adopting a proactive approach to learning and leveraging available resources is paramount. Free learning content is readily accessible through platforms like Skill India Digital Hub (SIDH), but you have to decide to go and consume it. Ultimately, the onus lies on individuals to seize these opportunities for continuous learning and growth, even in small increments, to thrive in an increasingly tech-driven world.

**At the national level, we are working on an ambitious and positive goal of development. Any thoughts on how the IT-ITeS sector fits into this macro picture? What more could be done to make sure the gains of digital revolution reach every citizen of this country?**

Bridging the digital divide is a multifaceted challenge, with equitable access to devices and connectivity being key components. Especially in rural and remote areas, ensuring that individuals have access to the necessary hardware and reliable internet connections is crucial. This effort requires not only providing devices but also expanding infrastructure to enable connectivity in underserved regions.

As mentioned before, IT is no longer a vertical. It has to cut across all sectors. But bridging the digital divide is a multifaceted challenge, with equitable access to devices and connectivity being key components. Especially in rural and remote areas, ensuring that individuals have access to the necessary hardware and reliable internet connections is crucial.

Through efforts of MSDE (Ministry of Skill Development and Entrepreneurship), NSDC (National Skill Development Corporation), and NCVET (National Council for Vocational Education and Training), we at IT-ITeS SSC are creating content to promote digital literacy so that individuals can better understand how to use technology to better their lives. Learning content available on SIDH and on FutureSkills Prime platform is available to all. But there is so much more that is happening and needs to happen to make sure the digital revolution reaches every citizen of the country.

One significant aspect of this awareness-building effort is highlighting the transformative power of language accessibility. Technologies like BharatGPT, designed to understand and generate content in multiple languages, hold immense promise in breaking down language barriers and democratizing access to information. We have just used Bhashini to translate the content of IT-ITeS SSC into 10 other national languages.

This is where technology can help hugely in inclusiveness. In addition to language accessibility, efforts to enable access to technology extend to promoting the use of feature phones and leveraging common service centres as hubs for digital resources and training. These initiatives aim to reach the last mile of connectivity, ensuring that technology truly serves all segments of society, regardless of their socioeconomic status or geographical location.

You can see that nothing is possible without collaboration. And the good news is that there are enough an more examples of these collaborations that will help us create a more inclusive and connected future for all.

# CHAMPIONING DIGNITY OF WORK: LOGISTICS SECTOR SKILL COUNCIL

## Ravikant Yamarthy

CEO, Logistics Sector Skill Council

Ravikanth Yamarthy, based in Chennai, is an accomplished CEO with a progressive industry background and decisive leadership. He provides strategic planning with an outlook towards the future. Ravi is ready for challenges and focused on meeting future demands. He prioritises performance improvements and works towards organisational goals. He is an adept cross-departmental manager and a tenacious leader who is willing to guide and expand organisations. He possesses strong communication, problem-solving, and tactical planning skills, in addition to a solid grasp of business ethics, project management, and team leadership.

**Can you tell us a little bit about your personal career journey? How did you come into the role of CEO for Logistics Sector Skill Council (LSC) of India?**

I began my career at Club Mahindra Holidays as a holiday consultant post-MBA and after that I moved to an internship role at Sutherland Global Services. I was offered a position after my internship, but I declined due to personal reasons. Throughout my career, whether at Club Mahindra or Sutherland, I consistently ranked among the top performers, earning credibility and respect. This led to rapid promotions, culminating in my role as CEO of Logistics Sector Skill Council (LSC) after a decade of dedicated service.

Reflecting on leadership lessons, my journey with LSC stands out. Over the course of my tenure at LSC, we have transformed into a significant player in the international market and become a financially self-sustaining organization. One key lesson I have learned is the importance of not becoming complacent. It is vital to start, nurture, stabilise, grow, lead, and then pass on responsibilities to others to explore new initiatives. This approach has enabled me to diversify beyond government schemes, ensuring self-sustainability.

Another crucial lesson is the necessity of outcome-based work. In a landscape where many initiatives do not get executed as per plan, consistency is key. Every initiative I have spearheaded at LSC has yielded positive results, thanks to persistent effort. I emphasise to my team the significance of persistence, especially in a landscape where we constantly need to adapt to the changing external circumstances. Managing this complexity requires a delicate balance of implementation, sustenance, and readiness to embrace new challenges.
In essence, persistence remains the cornerstone of success. My journey from an executive to CEO underscores the importance of perseverance in achieving one's goals.

**Tell us a little about the SSC you have been leading and its overall skills and livelihoods ecosystem. What are some unique aspects that set your sector apart from others?**

The Logistics sector is undeniably intricate, far beyond what many perceive. Let us put it into perspective: with a population of 1.4 billion, even a mere 10% daily e-commerce transaction rate translates to 140 million transactions. Ensuring that the product you ordered matches what you receive, amidst numerous destinations, products, suppliers, and delivery routes, within a three-day timeframe, is a logistical marvel.

Remarkably, 95% of this sector operates informally, largely

driven by Micro, Small, and Medium Enterprises (MSMEs), primarily focused on warehousing and transportation. Logistics permeates our daily lives, from commuting to work to receiving goods ordered online. Despite its omnipresence, Logistics remains largely unrecognised as a standalone career path.

Traditionally, Logistics careers have often been stumbled upon rather than actively pursued. However, LSC is taking several initiatives to change this narrative, introducing courses and qualifications in Logistics. We are transitioning from accidental logisticians to deliberate professionals, shaping a new generation of skilled workers.

The core skills revolve around warehousing, distribution, and transportation, which underpin nearly every aspect of Logistics. While informal practices often suffice, formal education and training are increasingly recognised as vital components for a thriving Logistics industry.

Looking ahead, the Logistics landscape is set to undergo rapid transformation. Factors like evolving consumer demands, climate change, and technological advancements will drive this change. Among the constants, storage and distribution will emerge as linchpins, particularly crucial in sectors like agriculture, ensuring year-round availability of perishable goods.

In essence, Logistics is not just about moving goods; it is about orchestrating intricate supply chains to meet evolving demands and challenges, shaping our daily lives and future landscapes alike. One last point to consider is that Logistics is connected to several other sectors in a horizontal fashion. Whether in Agriculture or Construction, there is an element of Logistics involved to attain the desired industry goals. Therefore, any positive changes in the Logistics sector also leads to positive outcomes for the other sector. Hence, we require a perspective shift and encourage more collaboration between Logistics and other sectors to accurately determine the workforce supply and industry demand for Logistics industry skill sets.

**Can you tell us a little bit about the skill gaps in the Logistics sector? What kind of challenges are we facing? And what are the interventions required to bridge those gaps?**

I appreciate your question, as it underscores the crucial need for policy intervention in the Logistics sector. Allow me to illustrate with a pertinent example. Unlike Western countries where part-time work hours are regulated, we lack stipulations in India. Consider Swiggy and Zomato, where many delivery workers are college students seeking part-time employment for various reasons, from personal finances to pocket money.

However, without clear regulations on part-time work hours, individuals may end up overworking to meet financial needs, risking their education in the process. Addressing this requires policy intervention from the labour ministry to define maximum hours for part-time work. Failure to do so perpetuates informal employment in platforms like Swiggy and Zomato, perpetuating the gig economy narrative, which is detrimental to the country's workforce.

Furthermore, we must address the issue of dignity of labour. There exists a concerning stigma surrounding certain roles in the Logistics sector, perpetuating the misconception that such jobs are only suitable for those with lower educational qualifications. Even our Qualification Packs (QPs) maintain this language, indicating that only individuals with minimal education are fit for roles like warehouse picking and packing. This undermines the dignity of labour and discourages higher-educated individuals from considering these roles.

The repercussions of this mindset are evident in Western countries like the UK, where a shortage of drivers has led to economic challenges. By contrast, in India, we have an opportunity to leverage our workforce, including drivers, by instilling a sense of pride and respect in these professions. Failure to do so will inevitably lead to similar challenges in the future.

In essence, there is an urgent need for comprehensive policy reforms to regulate part-time work hours and redefine the standards for dignified labour in the Logistics sector. Only through such interventions can we ensure the sustainability and inclusivity of the industry while fostering respect for all roles within it.

**We are currently on the cusp of what is popularly known as the 4th Industrial Revolution. Tell us ways in which technological and industrial advancements impact the Skilling Ecosystem for India?**

Essentially, while technological advancements may change how tasks are executed, the fundamental logic remains constant. For instance, distribution still involves picking and packing, albeit with potential alterations in methodologies. Therefore, in skilling initiatives, it is crucial to fortify foundational concepts while fostering innovation and adaptability.

Moving forward, skilling programmes should adopt open-ended training modules, nurturing critical thinking and problem-solving skills. Rather than prescribing rigid techniques, empowering learners to explore innovative approaches is paramount. This approach encourages individuals to transcend conventional boundaries and envision innovative solutions to emerging challenges.

From an educational standpoint, curriculum design plays a pivotal role. Emphasising "learning how to learn" equips

> *In the era of the Fourth Industrial Revolution, these skills are indispensable for staying relevant and contributing to the country's development journey. So, I would encourage students to develop these skills irrespective of the sector in which they eventually choose to make their careers.*

individuals for lifelong learning and adaptation. Instead of fearing job displacement due to AI, there is a need to embrace continuous learning as a means of staying relevant in a dynamic workforce landscape.

An illustrative example underscores the value of open-ended training. During a training session, participants were tasked with devising diverse packaging solutions. This exercise yielded a myriad of creative ideas, each addressing unique needs and challenges. By encouraging such inventive thinking, skilling programmes can nurture a culture of innovation within the workforce.

Considering evolving technologies, skilling approaches must evolve as well. Embracing creativity and flexibility in training methodologies is essential. This necessitates a shift from prescriptive to exploratory learning paradigms, empowering individuals to think beyond established norms and contribute to ongoing industry innovation.

**Can you talk about some of the initiatives being taken up by LSC to bridge the skills and livelihoods gaps and navigate the challenges you mentioned?**

Initially, our focus extended beyond merely setting standards and facilitating assessments. Recognising the need for a more comprehensive approach, we delved into the Logistics industry to align our training initiatives with real-world demands. This led to the development of our own Logistics Learning Management Systems (LLMS), enhancing the learning experience for trainees. These LLMS platforms offer interactive modules, formative assessments, and practical activities, fostering a deeper understanding of Logistics concepts and encouraging innovative thinking among learners.

Furthermore, we recognised the need to elevate the perception of Logistics careers and provide avenues for higher education and international mobility. To address this, we introduced courses like BBA in Logistics and established partnerships with international universities to offer MS programmes in Logistics. These initiatives aim to make Logistics an aspirational career choice and provide opportunities for professional advancement on a global scale.

Additionally, we tackled societal stigmas associated with certain professions, such as Logistics drivers. By offering incentives for international placements and promoting career progression within the Logistics sector, we aim to change perceptions and make Logistics careers more appealing to future generations.

In essence, our initiatives seek to address existing challenges in the Logistics sector by enhancing skill development, expanding educational opportunities, and reshaping societal attitudes towards Logistics careers. Through innovation and collaboration, we strive to create a more robust and inclusive skilling ecosystem that meets the evolving needs of the industry and empowers individuals to thrive in the Logistics sector.


**As we close this interesting and insightful conversation, any advice for our young readers who might be interested in making a career in Logistics?**

Innovation has become paramount in today's dynamic workforce landscape. As I interact with students across various colleges, I emphasise the significance of innovation as a crucial trait for career success. Unlike the past, where communication skills were often cited as the key to employment, today's rapidly changing trends demand a knack for not just communication, but for critical thinking, adaptability, and innovation. Innovation is not just about producing groundbreaking ideas; it is about constantly adapting to new technologies and trends, finding creative solutions to challenges, and thinking outside the box. Organizations value employees who can bring fresh perspectives and innovative approaches to their work, as this drives progress and competitiveness in the market.

Moreover, NEP 2020 echoes this sentiment, highlighting adaptability, critical thinking, and future skills as essential components of education. In the era of the Fourth Industrial Revolution, these skills are indispensable for staying relevant and contributing to the country's development journey. So, I would encourage students to develop these skills irrespective of the sector in which they eventually choose to make their careers. In the context of the Logistics sector, fostering innovation is particularly crucial. As Logistics plays a pivotal role in the nation's development, and professionals in this field must embrace innovation to drive efficiency, sustainability, and growth.

Lastly, I will re-emphasize the importance of dignity, respect, and aspiration in the Logistics sector. Recognising the value and significance of the work done by Logistics professionals is vital for promoting a positive perception of the industry and attracting talent. If we solve for dignity of work, we will see the sector growing rapidly and play the role of a strong contributor to the overall mission of *Viksit Bharat* by 2047.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