Skill Times from NSN

India's first e-magazine dedicated to skills, education and employability

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Reimagining technical education and training in India: Top 5 areas of improvement

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Editorial

Dr. Madhuri Dubey

Systemic changes are slow, gradual and often painful to implement. Particularly, when we are trying to make these changes to an education system that's been rigid, monolithic and unresponsive to the dynamic nature of employment. Nonetheless, it's heartening to experience the positive vibes in the midst of intense speculation. This is about how we plan and prioritise new interventions to address many issues while making small but significant changes in the evolving skilling ecosystem in India.

This edition of Skill Times from NSN takes us through myriad perspectives and views from leadership in the vocational space highlighting the credit framework, vocational degree and how technology can make a huge difference to outcome-based skill development. Let's continue to persevere and progress on a journey that may pose new challenges at every step. It's for us to turn those challenges into opportunities!

Thought leadership

Sudhakar Gudipati

Reimagining technical education and training in India: Top 5 areas of improvement

The pace at which technology is changing and the need for technical education and training to keep up with it is quite demanding. Industry 4.0 and digitisation of industrial operations is not limited to large enterprises anymore! With COVID-19 induced digital adoption in almost every industry sector and emerging skill-based job requirements, the need to acquire the right skills and knowledge has become imperative.
Against this backdrop, the role of technical training institutions in India like Polytechnic colleges and Industrial Training Institutes (ITIs) is of greater significance.

For decades, the Diploma and Certificate courses offered by these institutes have helped the industry with the skilled and semi-skilled workforce. To cope with the changes, it is essential to reimagine their purpose, teaching methodology and outcomes to re-align their contribution to sustainable economic development. We now need to address a few critical issues to reconstruct the landscape of technical education and training.

To present a quick snapshot of the private sector, at present, the technical training landscape comprises 10,000 private ITIs, 2300 private Polytechnic institutes and 4000 skill development institutes besides hundreds of training organizations.

1. Keeping pace with the changes

The Indian framework for technical education is threefold; at the top, we have the engineering colleges, followed by polytechnic colleges and then the Industrial Training Institutes (ITIs). While the ITIs cater to the entry-level skilling through many engineering and non-engineering trades, the Polytechnic streams fill in the middle layer, preparing the students for supervisory job roles. Few key facts before we proceed:

- Courses offered under the Craftsman Training Scheme (CTS) by various ITIs mostly follow an outdated curriculum
- A majority of ITIs do not possess the latest tools and equipment for practical training
- The trainers and instructors rarely get an opportunity to upskill themselves and update their knowledge in specific trades

To make the students industry-ready by imparting new-age skills, the technical training ecosystem must evolve and adapt to the rapidly changing industrial world. This calls for-

- Focused efforts to look into various aspects like the curriculum, infrastructure, practical training, standards, trainers and branding
- Strategic repositioning of the technical and vocational courses, especially, since a degree in Engineering is most aspired for

Today, the industry has moved on to intelligent machines, robotic automation and a highly networked production environment. Green technologies are fast replacing traditional ways of manufacturing for a sustainable future.

Do these changes reflect in the technical courses offered at various levels? Perhaps, a few of them! There is a need to ensure that the curriculum is modernized and the faculty are well-trained to meet the dynamic needs.

2. Capacity building and infrastructure development

One of the crucial challenges is to attract students to technical training programs. Gradual decline in the intake of students also affects revenues and the long-term sustainability of the private institutions. How do we analyse and address this issue?

Is this because of the inability of the institutions to adapt and transform themselves as the industry evolves? Or, is it because of other larger issues that have an impact on capacity building? There are many factors that affect the sustainable and profitable growth of these institutions, such as:

- Low enrolment because of low-esteem as a result of the sociocultural value attached to these courses
- The lack of awareness about the benefits of work-integrated learning
- Low apprenticeship adoption and continuous connect with the industry.

- Heavy dependence on CSR funds and hesitance to explore self-funding models
- Low investment in training of trainers and difficulty in attracting outstanding trainers with attractive compensation
- Inability to engage industry experts as adjunct faculty to share the latest knowledge and insights with the students

When it comes to infrastructure, in the case of ITIs, the grading system has set few benchmarks based on certain parameters. The performance of the technical training institutions in terms of physical infrastructure and technical talent adds to their image and impacts the intake of students.

Overall, the lack of physical infrastructure including good buildings and the latest tools affects their performance even though many private Polytechnics operate from the engineering college premises to make optimum use of the resources.

3. Technology integration and feasibility of practical training

The push from COVID-19 has been leveraged by many technical training institutions to integrate technology in the delivery mechanism. Nonetheless, the feasibility of practical training through a digital medium has been a matter of great concern. Admittedly, the nature of courses with a heavy practical component need training in a physical setup. To blend it with the virtual environment and demonstrate its effectiveness will need sustained efforts.

With the resurgence of COVID-19, technical training courses have to:

Accelerate their adoption of the phygital mode of training, design and delivery.

Besides providing a framework to offer blended learning, this could ease the transition to the workplace through virtual apprenticeships and other innovative forms of work-integrated learning

Facilitate improved connectivity and competitive data plans along with suitable devices to increase the reach of the courses by providing a flexible and personalised learning experience

4. Industry involvement in content development and quality assurance

Industry involvement, especially in the case of technical training cannot be reduced to placements. It's widely acknowledged that continuous industry participation and involvement can make a huge difference to any technical training program. Engagement with the industry is essential in:

- Modernizing the curriculum and updating the training content
- Ensuring practical training infrastructure in sync with the developments in the industry
- Sharing intellectual capital with the trainers through professional development and research
- Promoting public-private partnership (PPP) in ITIs by constituting Institute Management Committee (IMC)

To reduce the gaps between industry expectations from the training courses and the actual outcomes, many efforts are needed from both the stakeholders in making their engagement mutually beneficial.

5. Vertical mobility through multiple learning paths

For many, doing an ITI course would mean an end-of-the-road decision, which could have been compelled by a financial need.

The social implications of positioning ITI courses for dropouts, low achievers and students from certain socioeconomic backgrounds are yet to be amended.

Today, considering the potential of technical training and the dearth of suitably skilled people, one cannot afford to target only those who couldn't climb the academic ladder (scoring high) and those who come from socioeconomically challenged backgrounds.

But is doing an ITI course really a roadblock? Certainly not! Currently, there are flexible models for completing a degree programme like B.Voc, several apprenticeship opportunities, on-the-job training, practical training, industry exposure and many other perks.

NEP 2020 provides an opportunity to address these issues through options for the vertical mobility of students. It also makes provisions for multiple learning paths and the implementation of a credit framework that can open up new avenues for many technical students.

The steps ahead

It is time to revamp ITIs and upgrade them to be in tune with the changing requirements of the workplace. The courses and curriculum offered at ITIs need to be re-looked at in terms of their accessibility, relevance and quality.

The vocational education and training landscape in India should not be seen as an issue or task of big numbers and targets. Rather, it's an opportunity to cash on the potential of a large number of youths to be skilled, upskilled and reskilled and realise India's demographic dividend in its true sense. This calls for deploying innovative phygital models of education involving various stakeholders. As a first step, the ITIs and Polytechnics need to expand their vision and seek opportunities for long-term sustainability through continued student growth.

An appropriate infrastructure needs to be created not only to impart efficient practical training but also to transition to a digital economy smoothly. The vocational training institutions that are quality-driven, and technology-enabled will amplify innovation and thus achieve the goal of quality skill development. This will go a long way in changing the negative perception around skilling and low employability among the students trained from these institutes.

Sudhakar Gudipati,
Business Unit Head – Vocational Education,
TCS iON, Tata Consultancy Services

This unique B.Voc programme awards a university degree and an NTTF diploma – Here's how it works

Pratyusha Tripathy

Ms. G. S. Kalpana, Sr. General Manager and Management Representative, NTTF

Nettur Technical Training Foundation (NTTF), a pioneer in providing technical training, has launched a unique, B.Voc programme in partnership with prominent universities and colleges. The dual benefits of the programme award students with a degree and a diploma.

The three-year curriculum is built on a concurrent approach and provides students with the opportunity to earn a university degree as well as an NTTF diploma. Students with a B.Voc degree in a specific skill set are also eligible to apply for a specific skill-based visa for study abroad or explore many avenues for higher studies. It also makes them eligible to apply for several competitive examinations that mandate a three-year degree certificate.

Team NSN spoke with Ms. G. S. Kalpana, Sr. General Manager and Management Representative, NTTF, to learn more about the B.Voc programme's uniqueness and NTTF's collaborations with institutions for the programme. Continue reading to learn more!

Q. Please tell us about your collaboration with universities and colleges to offer B.Voc and what are the courses currently available for the students to enrol?

A: The main objective of our B.Voc programme is to develop individuals with the technical skills and knowledge needed for manufacturing and allied industries and products. As a result, NTTF has been offering B.Voc programmes in collaboration with universities since 2017. We've worked with VIT -Vellore Institute of Technology, KLE University- Hubli, and ARKA JAIN University – Jamshedpur, starting with Dayananda Sagar University in Bengaluru. We started with 20 students and now have over 300 students enrolled in our B.Voc programme.

Following is the list of courses being offered in collaboration with universities and colleges:

- Dayanand Sagar University – Bangalore (Karnataka)

B.Voc Degree + NTTF Diploma in Tool Engineering, Mechatronics, Computers and Information Technology (IT) for Plus Two students / ITI / Equivalent

- Vellore Institute of Technology (VIT) – Vellore (Tamilnadu)

B.Voc Degree + NTTF Diploma in Tool Engineering and Mechatronics for Plus Two students/ ITI / Equivalent

- ARKA JAIN University – Jamshedpur (Jharkhand)

B.Voc Degree + NTTF Diploma in Tool Engineering, Mechatronics, Electronics and Communication, Electricals and Electronics for Plus Two students/ ITI / Equivalent

Q. How is the NTTF model of B.Voc different from other B.Voc programmes since it has an in-built concurrent Diploma program.

A: A concurrent model underpins our B.Voc programme. Students in other B.Voc programmes are only eligible for a degree after completing their diploma. Following the diploma, universities offer lateral entrance in the second year, and students finish the course and receive their degree in two years.

When students enrol in a Diploma programme at NTTF, they also have the option of enrolling in a B.Voc programme. They will receive two certificates at the conclusion of the three years: an NTTF diploma and a university degree.

Q.Tell us more about the course design, why NTTF perceived the need to offer this format of B.Voc and how you ensure industry alignment for curriculum and placement?

A: Our B.Voc programmes are designed in accordance with UGC guidelines. Vocational skills, general education with a focus on practical work, on-the-job training, and project work are all part of the curriculum. The courses are based on a credit system, with practical and hands-on training accounting for more than 60% of the curriculum. Our slogan is learn while producing and produce while learning.

We invite industry representatives to the Board of Studies(BOS) to ensure that our courses are industry-aligned, and we use their inputs in curriculum design. Our placement process has been greatly facilitated by implementing a syllabus that is aligned with industry requirements, ensuring that our students are industry-ready.

For example, a number of our students were offered an Internship with Lufthansa India, Duroflex, Bharat Fritz Werner Ltd, Textron India etc. and were later hired by the same company. When it comes to choosing students for brief apprenticeships, industries prefer to choose students who are enrolled in our B.Voc programmes.

Q. How is the response to the program? Do you notice any trends in the type of student enrolment and industry participation?

A: Both students and parents appreciate NTTF's B.Voc programme since they have always desired a degree with a diploma. After completing their B.Voc, students are eligible to pursue an MBA, as well as appear for UPSC, Bank & Railways examination and other competitive tests that require a basic degree.

Since it is equivalent to a regular degree programme, there is a high level of interest in enrolment. We began with 20 students and now have over 300 students enrolled in the programme. The response from the industry, like that of the students and parents, is enormous and encouraging!

Q. Are there options for multiple levels of certification and flexibility to exit and rejoin the programme based on the credits?

A: In our diploma programmes at NTTF, we've introduced multi entry-exit options where students can receive certifications even if they discontinue at the end of the first or second year. We haven't yet incorporated the flexible exit and re-join option in the B.Voc programme because it is a concurrent programme in which students receive both a diploma from NTTF and a university degree.

The B.Voc programmes are a recent initiative from the Ministry of Education and UGC, aimed at aligning higher education with industry needs. This programme ensures that graduates have the necessary knowledge and skills for work and entrepreneurship, which is why practical training is a major focus of the courses. With a B.Voc degree in a specific skill set, rather than a general work permit for foreign study, one can apply for a specific skill-based visa as well.

Q. How and when did the collaboration with universities start? Was there any strategy behind it?

A: Universities have been collaborating with NTTF in response to NEP 2020's emphasis on beginning vocational training alongside general education.

The B.Voc programme benefits both NTTF and the partner institutions since it allows the universities to offer technical training to their students while also assisting NTTF in launching a degree programme for its students. Universities are referred to as Academy partners, while NTTF is referred to as a Skilled partner in the collaboration.

Q. Any other points you wish to mention...

A: The B.Voc programme will continue in the future with more skill components that are used for a technical degree. NTTF believes in the 'Learn and Earn' strategy and it is being implemented in our B.Voc programs as well. NTTF pioneers in providing practical based diplomas to students and Creating Skilled Champions for the Industry. Now we are venturing into the B.Voc programmes with practical training as it is going to be in demand in the future and it's the need of the hour too!

Credit Framework: Integrating formal and vocational education

Ms. Sunita Sanghi and Dr. Gagan Preet Kaur

To reap the demographic dividend, India needs to equip its workforce with employable skills and knowledge so that they can contribute substantively to the economic growth of the country. The need of the hour is to align training with the needs of the industry while understanding the needs/aspirations of the youth.

Currently, vocational education is perceived to be inferior to mainstream education. However, this concern can be dealt with re-imagination of how vocational education is offered to students in the future. The National Education Policy 2020 (NEP 2020) lays stress on the integration of formal education with vocational education at all levels in a long way.

The key building blocks for this integration includes

- Credit framework
- Standardizing qualifications by aligning with NSQF)
- Continuous improvement in the curriculum
- Training of Trainers
- Alignment with industry needs

This article focuses on establishing equivalence and mobility between vocational education and general education through a credit framework.

Need for Credit Framework

The National Education Policy 2020 gives impetus to credit-based courses for holistic and multidisciplinary learning. The policy focuses on principles such as learning by doing value-based and multidisciplinary education through local industry internships, research internships, community engagement, etc.

While choosing courses based on local opportunities and skill gap surveys, academic institutions are to collaborate with **ITIs, Polytechnics, Local Businesses, NGOs**, etc. The NEP 2020 not only envisages exposure to vocational education from the upper primary level with **experiential learning** but also proposes vocational education expansion through NIOS for those youth who are not able to attend physically.

It is seen that many youth who drop out of the education system, either enter the labour market without training or may undergo **short-term training**. Given this fact, it is important to ensure that vocational and academic education are interlinked with provisions for mobility with vocational education, vocational to academic and vice versa with suitable credits for prior experience.

Accordingly, vocational courses offered in schools can be mapped to ITIs, B. Voc and higher education institutions under NSQF so that weightage could be given to students for entering higher-level vocational education to ensure vertical mobility.

A credit framework for vocational education will –

- Help people convert learning to recognizable skills to ensure them movement in their career
- Aid in breaking the myopic perception that short-term courses are standalone/ dead-end courses with no well-defined linkages either with long term qualifications within vocational education framework and any equivalence with the general education.

While facilitating mobility between vocational and formal education, the credit system through the transfer of credit will –

- Enable the learner to drop a subject already studied or take the next level course in that subject
- Seek direct admission to higher-level such as direct second-year admission, etc.

The credit system would facilitate multiple entry and exit and facilitate the persons with prior experience and undergoing RPL mobility in their career.

However, it is important to identify components of the credit framework; mechanisms for assigning and accumulating credits across various forms of education covering a large number of boards and university ecosystems so as to ensure seamless mobility across academic and vocational education.

Given this premise, it becomes imperative to establish and formalize a system of credit allocation; accumulation and transfer not only within the **skill development ecosystem** but also with forward linkages to academic education.
Therefore, the most important task is to define what constitutes credit and what could be its potential unit given the differences in academic and vocational education. The number of credits may be worked out on the basis of the number of notional learning hours that an average learner at a specified NSQF level might expect to take to achieve the learning outcomes, including the assessment.

Deconstructing the Credit System

UNESCO defines a **credit system** as a system that provides a way of measuring and comparing learning achievements (resulting from a course, training or placement) and transferring them from one institution to another, using credits validated in training programmed.

CEDEFOP defines a **credit system** as an instrument designed to enable the accumulation of learning outcomes gained in formal, non-formal and/or informal settings, and facilitate their transfer from one setting to another for validation and recognition.

A credit system can be designed by describing:

- An education or training programme and attaching points (credits) to its components (modules, courses, placements, dissertation work, etc.), or
- A qualification using learning outcomes units and attaching credit points to every unit.

This helps educational institutions to organize their study programmes whereby both credit accumulation and transfer, facilitate lifelong learning and access to workplace training. In the Indian context, the definition by the CEDEFOP is more relevant given that a large proportion of people entering the labour market may not be having formal training or formal education but have gained skills and knowledge which can be validated and recognized with the help of the credit system.

The credit accumulation therefore would include skill training, experiential learning and academic education. This would help them in continuous learning and provide them with mobility pathways. In developing a holistic credit framework, we can look at both national and international models.

National models of Credit

- Choice Based Credit System (CBCS) by UGC is being implemented in several universities across the States/UTs.
- Skills Assessment Matrix for Vocational Advancement of Youth (SAMVAY) credit framework is functioning in the community college scheme for Diploma (Voc) courses.

In both CBCS and SAMVAY, theory, practical and experiential learning are awarded credit points. The B.Voc system provides multiple entry and exit and weightage are given to both general and skill components. The basic principle for allocating credit is successful assessment.

Academic Bank of Credit: The NEP, 2020 proposes to establish an 'Academic Bank of Credit' (ABC) which could digitally store the academic credits earned from recognized institutions so that the degrees can be awarded taking into account credits earned at various levels. The bank has already been inaugurated by the Honorable Prime Minister.

International Models of credit

- Scottish Credit and Qualifications Framework (SCQF)
- Sri Lanka Qualification Framework (SLQF)
- European Credit Transfer and Accumulation System

Constraints to be addressed

- Defining credit value for various levels of formal education and **technical education** for accumulation and transfer especially in India where there exists diversity across school boards and also levels of higher education; pedagogy and curriculum variation.
- The dilemma of focusing on duration or depth of course or both for assigning credit values.
- Defining time duration for achieving a particular competency
- Providing credit to **experiential learning** and mapping it to NSQF
- Mapping of ITI courses with the **higher education system** and NSQF
- Progression from **short term courses** to schools, given short-term courses do not have well-defined progression pathways. While the **credit framework** can be designed theoretically, implementation needs to be monitored. It may face problems in actual implementation.

In this regard it's worth mentioning that in 2016 to break the barriers between formal education and skill development, an MoU was signed between the Directorate General of Training and NIOS under the Ministry of HRD (now, Ministry of Education) for putting in place a system for academic equivalence to vocational/ITI qualification, thereby opening options to meet aspirations of those candidates of ITI system who want to attain a high academic qualification in addition to their skills.

This MoU also opens pathways for ex-trainees of ITI, holding National Trade Certificate (NTC) to earn secondary/senior secondary qualifications.

- Establishing ITI and NIOS equivalence at various levels of school education
- Possibility of bundling SSC courses to give equivalence with long term ITI programme and ensuring progression to vocational courses in academics (B. Voc).

However, the progress has been very slow.

(The views expressed in the article are personal and do not reflect the views of the Ministry).

Ms. Sunita Sanghi, Former Principal Adviser, MSDE

Dr. Gagan Preet Kaur, Urban Skilling Specialist, Ministry of Housing and Urban Affairs

Other news

Skill Development and Entrepreneurship Opportunities in Himachal Pradesh

Pranathi Kolikapudi

Himachal Pradesh significantly enhances skills in specific industries and provides job opportunities for skilled workers. Along with Tourism, Himachal Pradesh has various other industries such as Pharmaceuticals, Power, Agro and Food Processing and more which contribute significantly to the state's economy.
With numerous skill development initiatives, it aims to produce industry-ready workers and prepare youth for employment and entrepreneurship.
Read more

Bridging welding skills gap in manufacturing through upskilling

Sahitya Karra

Welding is at the heart of every manufacturing and fabrication process. It is a precise, reliable, cost-effective, and high-tech method for joining materials that are extensively used across various manufacturing industries.

The advancements in welding hold even greater promise as techniques and methods are being improved for joining dissimilar and non-metallic materials.
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Top tech trends to watch out for in 2022 with an insight into the future of work

Pratyusha Tripathy

In 2021, we made it through the pandemic thanks to technology, which continues to reinvent and restructure how we work, live, and interact. But what awaits us in the year 2022 in terms of top tech trends and market demand?
Demand for IT talent has risen dramatically across all industries. Emerging technologies such as AI, ML), and the Internet of Things (IoT) across industries such as IT/ITeS, logistics, etc. are the primary causes for the growing demand. Read more

You can't grow your business alone. Put people first.

Guest Author

The pandemic fundamentally has altered how professionals view their careers.
April 2021 saw a record 9.3 million job openings. Although companies wanted to hire, workers weren't exactly ready to return to work. Almost a year later, many companies are still struggling to find workers and are seeking out new ways to recruit talent. The way forward as we see it is for companies to get creative.
Read more

Setting rational quality parameters in skill development programmes

Sahitya Karra

"Quality should be seen as an enabler and not a roadblock", says Ms. Ajita Karve, Principal Lead – Design and Quality, Tata STRIVE.
In a race to chase the numbers and targets, quality often takes a back seat while implementing skill development programmes and initiatives. It is high time that training companies and organisations set rational quality parameters in skill development programmes.
Read more

Learn more about Tata STRIVE'S initiatives in Skill Development!

DESH-Stack e-portal: Will the cross-skilling portal position India as a global talent hub?

Pratyusha Tripathy

Only 48.7% of India's overall youth are employable, according to Wheebox's India Skills Report 2022. This means that nearly one in every two Indian youths is unemployed. According to the study, roughly 75% of all organizations surveyed acknowledged a skill gap in the industry.
Budget 2022 prioritized skilling and skill development measures to close the skills gap and make the youth more employable. One of them is the announcement of the establishment of a DESH-Stack e-portal.
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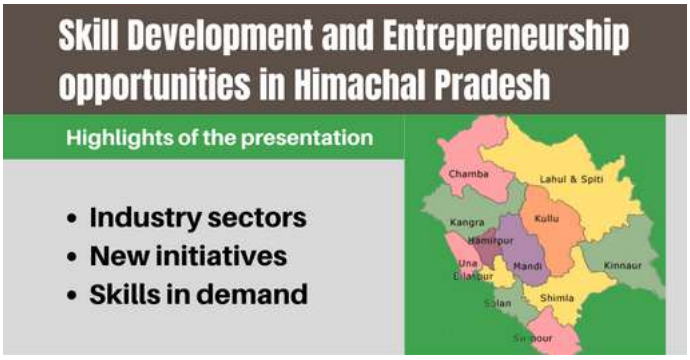
Videos



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- CII Karnataka Skills Conclave: Skills For Resilience And Agile Future
- PM Modi addresses Skill India's webinar on Budget 2022 implementation
- NSN weekly round-up on skills, education and training – 01032022
- NSN weekly round-up on skills, education and training-22022022
- Skill India webinar: Towards Fostering Stronger Industry-Skill Linkage

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