Technological Interventions for Sustainable Skill Development Programs in India

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Abstract: A skilled workforce is a fundamental element of a vibrant economy and sustainable livelihood in any country. In the recent past, India has launched various skill-building initiatives/models to enhance and increase the skilled workforce. The existing models have yielded good results in identifying the skill needs of the country. However, it has lacked in implementation, monitoring and identification of trainers and trainees. Also, the existing model has been lagging in setting up proper training infrastructure for imparting skills among the beneficiaries. Besides, the current models are ineffective in addressing major challenges including societal perception and awareness. With fast-changing industry requirements and the growing aspirations of youth, changes in the skill development strategies are the need of the hour. In this paper, we explored the existing skill development programs run by the Government of India in public and public-private partnership models. After a thorough and systematic analysis of the existing model and by comparing it with other models, we propose a technological intervention-based model for sustainable skill development programs in India. It may act as a one-stop solution to bridge the skill gaps by involving all stakeholders, including beneficiaries, industries, government, and trainers/training centers.

1 INTRODUCTION

Equipping the workforce with the right skills required for the jobs of today and those of tomorrow is a strategic concern in the national growth and sustainable development. Decent work, a universal aspiration, is the best path to self-advancement of women and men. It fosters the stability of communities and families. Skills are pivotal to decent work strategies and skill training programs have been viewed as a medium to eliminate unemployment (Jain et al., 2019). There is a sincere effort by international policy makers in building a strong bridge between the world of work and short term training providers in order to match skill needs of enterprises. At its core, the skill training initiatives are designed to create a sustainable livelihood for deserving beneficiaries. The training programs are often operated at the sector level where there is a direct participation of employers and workers together with government and training providers. Government policies and measures are required to facilitate access to training and skills development by individuals and economically weaker groups including poverty and low income, ethnic origin, disability and migrant status. Adequate public-private partnership initiatives are critical to ensure sustainable skill development programs. Further, a continuous workplace training

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and lifelong learning would enable workers and enterprises to adjust to an increasingly rapid pace of change in technologies and requirements. Skill training not only generates employment opportunity, but is also important in sustainable economic development. A case study on skill development training programme highlights the importance of skill training and its impact on the GDP of India (Venkateshwarlu, Sharma and Agarwal, 2016). In short term skill trainings, Internet of Things based technologies have been explored to improve decision making process and to achieve important educational objectives (Vihervaara and Alapaholuoma, 2017). In this paper, we have discussed the existing skill development model, its key challenges and proposed a holistic approach including a technological intervention strategy for achieving a sustainable skill development program. Effective grass root strategies including change management tactics, alternative resources for training and technological interventions have been discussed in depth. Technological interventions can in fact catalyze the program by linking all stakeholders with up-to-date information and opportunities in the sector.

2 EXISTING MODEL

Vocational education is traditionally non-academic and teaches the skills and knowledge required for a particular trade, craft or job function. These training program provide job-specific technical training, with hands-on instructions. In India, Ministry of Skill Development and Entrepreneurship (MSDE) through National Skill Development Corporation (NSDC) has implemented Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 2016-20 with a target to cover 10 million youth in the country with a budget allocation of Rs.120 billions. The scheme is implemented with the objective to enable a large number of Indian youth to take up relevant skill training that will help them in securing a better livelihood. It was a reward based scheme, which provided entire cost of training as reward to successful candidates. PMKVY has two components:

- Centrally sponsored Centrally Managed:

This component consists of 75% of the PMKVY and is being implemented centrally through NSDC.

- Centrally Sponsored State Managed:

The component consists of 25% of the PMKVY and is being implemented by the states as per the local needs.

2.1 Selection of Beneficiaries

The skill training imparted at government training centers (TCs) is aimed towards the candidates who are:

- School/college dropouts
- Unemployed
- Low income groups
- Marginalized sections of the society

Upon successful completion of training and certification, candidates are provided placement assistance by training partners (TPs). As per new education policy, the skill development program has been planned at the school level itself at the age of 13 years along with academics. For example, if a student opts for motor repair as a skill development course while in school, at a later stage, he can opt for a diploma or degree in automobile engineering. Skill training for students while in school helps them achieve sustainable livelihood in case if they drop out of school due to their economic constraints. To bridge the skill gaps in the school curriculum, a two year model for skill development during class 9-10 or 11-12, has been implemented in Haryana by PMKVY (Rani, 2021).

2.2 Selection of Sectors

The government has conducted an extensive skill gap study and identified about 333 job roles that are in demand across 36 sectors (PMKVY, 2018). Some priority sectors with job roles are shown in Figure 1. New roles sectors are introduced into the skill development program after periodic assessment of needs and demands by sector specific councils (SSC). There are 38 SSCs currently operational. The governing councils of SSCs involve over 600 corporate representatives to create strategies and operational plans for standardized skill training as per the industrial requirements.

2.3 Training Program

Duration of the training varies according to the job role, however, the majority of courses range between 200-600 hrs (2-6 months). The training is provided according to the National Skills Qualification Framework (NSQF) in different job roles with Soft Skills, Entrepreneurship, Financial and Digital Literacy curriculum, a part of the curriculum. For example, in agriculture sector, PMKVY provides training on 36 job roles including animal health worker, bamboo grower, medicinal plants grower,

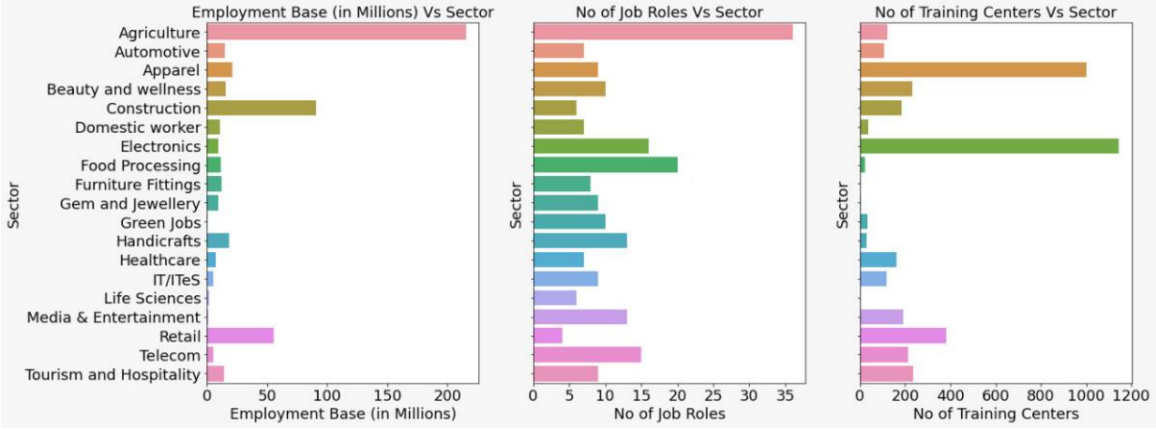

Figure 1: Supply and demand of skilled manpower in various sectors in India. Courtesy: PMKVY. http://www.pmkvyofficial.org/Training-Centre.aspx

organic grower, micro irrigation technician, solar pump technician.

The youngest nation, India needs millions of skilled trainers to skill over 500 million youth, (Misra, 2015). Standardization of trainers and finding the skill needs of India and the world market is crucial for sustainable skill development. Further there is a need to develop local trainers as the trainers need to explain things in their mother tongue to students to enhance the scope of skill development programs. As per the PMKVY portal data, 6116 training centers have been established and currently operational contributing to train the unemployed youth and low income group on different job roles. The training centers have spread across states and union territories, bringing up a significant change in the skill landscapes.

2.4 Outcomes

Skill India was a flagship programme launched by the government in the year 2015 has led to transformational change in India's vocational training ecosystem. As per the government reports, nearly 2.04 million youth have been trained under the mission (NSDC, 2020). However, only 0.186 million trained youth have been reported officially placed. Placement data available indicates that only about 9.1% of the persons trained were able to get the employment.

3 RESEARCH GAPS

India has an advantage of demographic dividend to achieve high economic growth however skilled manpower appears to be biggest challenge in every sector, Figure 1, reflect the skill gap in each sector. For example, in agriculture sector there is a major gap between demand and supply of trained manpower. Training the manpower with latest developments in various job roles would enhance productivity while providing sustainable livelihood to the beneficiaries. Government of India has initiated several programs to fill up this gap but not seeing the expected outcome for planned programs.

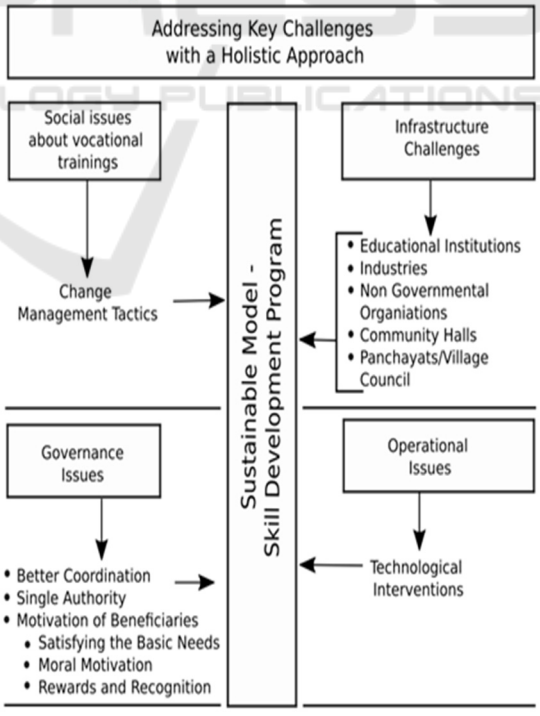

Figure 2: Illustrates key challenges and tools to address the challenges.

The entire skill training activity is facing multiple challenges. In this view this research article is an attempt to understand the challenges and suggest holistic model for sustainable skill development model.

4 KEY CHALLENGES

This section illustrates various challenges of skill development program. Here we have identified and classified all the challenges into four category; social challenges, infrastructural challenges, governance issues and operation issues. For sustainable implementation, skill commission need to address all the challenges.

4.1 Social Challenges

Changing one's mind in favour of vocational education seems to be a big challenge. This also becomes a non-polar choice and it has been stigmatized, many perceive it as an inferior option compared with formal education. The social challenges may include poor awareness, perceptions and poor aspirations (Joshi and Pandey, 2021).

4.1.1 Poor Awareness

Despite 76% of youth interested in enrolling themselves in skill development programmes, 70% of adults aren't aware of the much publicized skill development programmes run by the government to boost employment, according to a major study (BI India Bureau, 2018). The findings also suggest that the youth is more interested in sectors which are expecting less growth in the coming five years, pointing out the mismatch between youth aspirations and industry demands. Inclusive awareness strategies involving all stakeholders are needed to catalyse the skill development initiatives.

4.1.2 Aspiration Issues

Generally, children and parents prefer to enter the general academic schools, however, unlike India; the Chinese government encourages the adoption of vocational education by incentivizing it financially (Mehrotra, 2016). Even parents, at times, behave so carelessly that the very essence of the vocational course is undermined (Kaur and Dogra, 2018). There is a critical need for creating an encouraging environment for skill development in India (Tara and Kumar, 2016).

4.1.3 Poor Perceptions

In today's society, many young people avoid blue collar jobs as they feel it is a less valued profession. Due to this perception, people often flock to white collar jobs. Unfortunately this problem has led to a shortage of skilled blue collar workers taking important job roles such as welders, machinists, freight carriers, tractor operators, irrigation technicians, lab technicians and so on.

4.2 Infrastructure Challenges

4.2.1 Training Infrastructure

The existing scheme is sound, however due to stringent approval processes, a much less number of training centers (TCs) have come up in the last five year of the program. For example, in agriculture sector, the employment base is 220 million, but the number of training centers have been created for this sector is only 120 as shown in Figure 1. The data reveals that there is mismatch between skilled labor and demand (Jagtiani, 2013).

4.2.2 Skilled Trainers

The other problem faced by the skill development program is trainers to train on needed semi skills. This problem is basically due to excess dependency on formal education and white collar job expectation. In the prevailing situation identifying suitable trainers is a big challenge as existing professionals do not have any accreditation to work as skill trainers. To train millions of youth and unemployed in various job roles, a few million trainers are neededd and the challenge need to be addressed.

4.3 Governance Issues

4.3.1 Convergence of Schemes

There are 36 different bodies in India running skill development programs. The subsidiaries of these bodies are working at the state level. There are a considerable duplication and overlap of work by these agencies. Therefore, there is a need to converge the efforts of these departments/ministries to give a composite package of skill development. Lack of coordination between different agencies will result in poor outcomes (Saini, 2015).

4.3.2 Involvement of Private Firms

A survey conducted by World Bank Enterprise in 2014 showed that only 35.9 percent of firms in India are funding the formal training of their employees. In comparison, 79.2 percent of Chinese firms are supporting skill training. This is with reference to formal employee force, not much training happening for informal employee force. Therefore, there is a challenge before the government to convince the private firms to invest in skill development initiatives (Nataraj, 2014). Private sector may be considered for curriculum development and policy formulation related to educational and vocational training (Pilz and Regel, 2021).

4.4 Operational Issues

The present skill training activity run under multiple platforms and facing several coordination and monitoring issues. This flaw is one of the reason for poor visibility and low success rate of the program. Even though India is a technologically advanced country, the same is not reflecting in skill training implementations. The flaws can be solved by using suitable technological tools where ever suitable.

5 INTERVENTIONS

5.1 Social Interventions

As discussed earlier altering the social perception, while creating awareness and aspirations, is necessary for successful implementation of the skill training program. The perception can be altered through enhanced visibility and recognition activities. Awareness can be brought using local media and effective reach programs. Aspiration generation is another important requirement which can be achieved through success stories of previous beneficiaries and by showcasing employment opportunities and better earnings available in the present system.

5.2 Infrastructure Interventions

Infrastructural challenges can be addressed by leveraging existing facilities in urban and semi urban areas. Any under-utilized educational and non-educational institutions which can be chosen for skill training activity to fill up the perceived infrastructure bottleneck. Skilled trainers are the foundation for the entire program, skill commission need to develop strong database and attractive remuneration to retain and nurture the important resource of the program. Trainers may include

- Seniors in the profession
- Engineers and Diploma Holders
- Industry workers
- Farmers
- Professional trainers

To make best use of trainer resource, they may be provided options and freedom to participate in the program as a full time or part time trainer.

5.3 Governance Interventions

As discussed earlier, India has multiple and overlapping agencies to train on skill needs. This resulting into poor coordination and low visibility among the participants. Hence developing a single platform is necessary either by using single technological tool or by merging multiple agencies into single agency to take up the skill training needs. The agency is also required look into basic needs and motivational activities to attract and execute the training program. Agency can pick up suitable reward and recognition while training the participants. The governance flow and coordination is illustrated in Figure 2.

5.4 Technological Interventions

The technological interventions strategy is presented in Figure 3, would be helpful in solving the key operational challenges by ensuring direct participation of employers and workers together with government and training centres through a single platform. The proposed software obtains skill demands in different localities, allows registration of training centres/trainers and maps beneficiaries to a nearby training centre through GPS tracking. The interventions proposed in Figure 3, include effective technological tools for identification and validation of skill trainers, preliminary processing and assessment of beneficiaries and also for evaluation of overall outcomes of the skill development program.

5.4.1 Block chain Technology

Technological interventions based on latest technological trends like blockchain can be introduced in the implementation of sustainable skill development model. Blockchain is a secured database that differs from a typical database in the way that it stores information, blockchains store data in blocks that are then linked together.

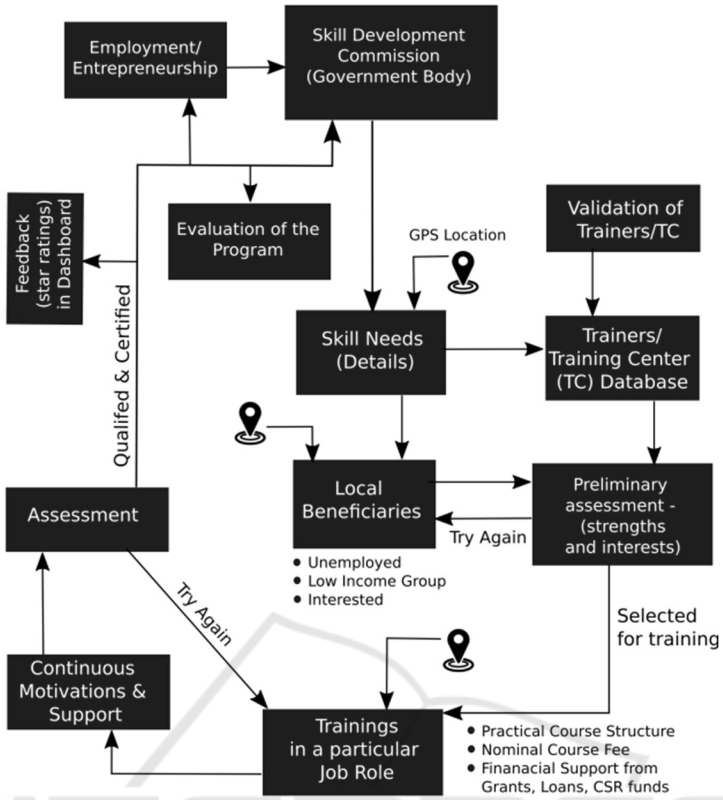

Figure 3: Technological Interventions for a Sustainable Skill Development Program.

For example, block chain can help with efficient authentication of the beneficiaries by the previous beneficiaries who have got authenticated before in the process. Each additional block strengthens the verification of the previous block and hence the entire blockchain. Blockchain networks can eliminate the administrative burden, reduce the cost of operations while providing better security and control over the entire system of database.

5.4.2 Trainers Selection

The proposed technological interventions will have a dedicated software module for skill trainers. The module will create a robust database system to include a large number of diversified and experienced trainers who are readily available for training the beneficiaries in different sectors. The trainers can be directly register with their detailed profile, expertise (to train in a specific job role/sector) and their availability details in the system. The software will review the profile of trainers with standard evaluating parameters and provide ratings to the successful trainers in different sectors. The proposed model continuously interacts with trainers through advanced technological communication tools and maintains relationships with all the trainers. The trainers can access the work available for them in the proposed software and can start the work independently or by associating with training partners/training centres.

5.4.3 Beneficiaries Interest Mapping:

Attracting and identifying the beneficiaries is most crucial for the success of the programme. In our technological interventions, we propose a simple and convenient software tool for beneficiaries. The tool may have the following features:

- The beneficiary can register with the program by way of using a smart phone application or by giving a miss-call to a specific phone number. Beneficiaries can also register by sending a message to the given phone number.
- The tool will collect the information of interested beneficiaries then the back end team will follow up with the beneficiary.
- The software tool will have a set of activities to assess the beneficiaries interests and strengths to train the candidate in a suitable area.

- Candidates will be evaluated continuously in their area of training and a learning grade will be decided at the end of the program.

A database of potential beneficiaries with their profile and GPS location will be made available in this software tool for allocation of trainers.

5.4.4 Motivation of Beneficiaries:

An extrinsic motivation drives a person to act under the effect of an external factor: this may be an economic incentive, but it is the motivation that actually allows learning to happen. Motivation is what turns an interest in a subject and a desire to get ahead into actual action. In the technological interventions proposed, we are proposing a software module for continuous motivation of beneficiaries who undertake training through a training centre or trainer.

This module shall include moral motivational video shorts (of previous beneficiaries) and rewards and recognition apart from ensuring that their basic needs such as healthy food and necessities are available to them freely. Rewards and recognition may be provided for prompt responses during the training activity to make the learning more interesting and sustainable. Beneficiaries may also be motivated in a specific job role with the help of simulators. For example, an excavator operator initially can be trained in the simulator before he gets into the real training on the vehicle.

5.4.5 Program Outcome Evaluations

In the existing skill development model, the evaluation process shows only consolidated data and does not provide any information about outcomes in each sector. To encourage participation of stakeholders, the outcomes need to be analysed systematically and on a frequent basis. The technological interventions we propose here shall include a systematic outcome evaluation software module with the following features:

- Assessing all beneficiaries on individual interests/strengths.
- Assessing all beneficiaries on trained domain.
- Evaluating the beneficiaries on placement activity.
- Analyzing the beneficiaries on self-employment opportunities.

The software module will evaluate the overall success rate of the skill training programs based on the data of number and percentage of trained beneficiaries employed/self-employed in different sectors. The income levels of trained beneficiaries will also be considered in the program outcome analysis.

6 SUMMARIES

In India, government plays the dual role of policy maker and regulator. There are various implementation models. Skill training is largely government-driven program, while constant efforts are made to increase private sector participation. In the existing model the skill training providers are functioning separately without proper coordination and evaluation of the outcomes of the program. Due to these ineffective models, the skill training program is lagging behind in achieving the desired objectives. The agency is required to address all the challenges including social perception and awareness. The agency is also required to look into operational, infrastructural and coordination challenges for successful and sustainable skill training program. After a thorough research of the existing model and by comparing with other successful business/ sustainability models, we recommend developing an integrated software and technological tools as a one stop solution for skill needs of the country.

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