

# A Review of Earlier Works on Growth of Polytechnic Education in India and Abroad

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## ABSTRACT

*Skills and knowledge are vital components for the betterment and growth of any nation, and this fact is now recognized worldwide. Skill gaps are present in the Indian education system; it's very important to bridge these gaps to make people employable. Skill development is pivotal in enhancing the employability of pass-outs of technical educational institutes like polytechnics. The employability of pass-out students is a critical issue, and this can only be improved by enhancing their skill sets. Technical education provides the relevant and sufficient skills that industries demand by keeping in mind the current changes happening around the world. Technical education, especially polytechnics, helps bridge students' skill gaps. Extensive literature related to this field was studied to analyze the growth of polytechnic education in India and abroad.*

**Key Words:** *Polytechnics, Skill Development, Employability Skills*

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## 1. Introduction

Skills and knowledge are linked to human capital investment; it further facilitates socio-economic advancement and progress in a country. Economies that possess enhanced skills and knowledge are more adept at effectively handling the possibilities and obstacles of globalisation. India, in particular, is poised for a transition into a knowledge-driven economy, where the capabilities of its population to create, apply, and share knowledge will be a crucial determinant of its competitive edge. The current circumstances in the country underscore the need for a workforce characterised by knowledge, analytical proficiency, flexibility, multi-skilling, and adaptability (Goel, 2011). India, a developing nation, is making concerted efforts to elevate its status to that of developed countries by maximising its available resources. However, a significant obstacle to this advancement is the country's vast population, which reached 121 crores in 2011, according to the 2011 Census. Most of this population depends on agriculture, with a substantial number residing in suburban areas. Notably, the count of skilled individuals in rural areas is relatively low. To address this, there is a need to focus on enhancing the technical expertise of residents in both urban and rural areas.

Technical education plays a significant part in propelling a nation's progress by nurturing the development of highly skilled workers, enhancing productivity, and raising the overall quality of life. In the contemporary landscape marked by swift advancements in science and technology, there is an urgent need to cultivate individuals with proficiency and up-to-date knowledge that can meet the changing demands of both society and industry. The rapid industrial advancement of any country can be credited to the incorporation of technical education, offering a systematic pathway for individuals to acquire practical experience in producing goods and services—a fundamental element for the advancement of a nation (Golwala, 2017). Technical education plays an essential part in developing the skills of the population in any country. Individuals' knowledge and skills are vital for socio-economic growth and economic advancement. Implementing relevant policies focused on skill development is imperative for improving economic conditions within the state (Kanchan and Varshney, 2015).

Skill development has gained prominence in the 21st century, with states giving it significant attention. To harness its considerable potential in boosting overall productivity and generating more job opportunities, skill development must be seamlessly incorporated into comprehensive strategies related to employment and development. Government policies should prioritise establishing and supporting institutional structures that empower employers, ministries, training institutes, and workers to respond adeptly to changing skill

requirements. This necessitates adopting a forward-thinking and strategic approach to facilitate and sustain social, economic, and technological advancements (ILO, 2008).

Graduates from educational institutions often lack the essential and adequate skills demanded by the industry. In the current context, the imperative is to narrow these skill gaps, necessitating persistent endeavours in skill development. Equipping the upcoming workforce with the necessary skills aligned with enterprise requirements is crucial to ensuring seamless integration. There is an urgency to upgrade and upskill the workforce, as failure may render them obsolete, inconspicuous, and eventually phased out from the professional landscape. Skill development is a pivotal solution to effectively address this challenge (Behera and Gaur, 2022).

Skill development helps improve any individual's employability skills and benefits them while gaining employment. Technical educational institutes, especially polytechnic ones, must include employability aspects while framing their curriculum so that pass-out students get employment quickly after completing their courses. Employability skills should be regarded as indispensable for every graduate, and these skills play a vital role in preparing TVET graduates for the labour market. The term "employability skills" encompasses various names for example essential skills, core skills, generic skills, and more, evolving into a universal concept. The fundamental principle involves the development of capabilities beyond technical skills (Bridgstock, 2009).

A polytechnic is an educational institution that provides technical training and vocational education. It is a component of technical training that concentrates on teaching specific techniques, technical procedures, and skills. Polytechnics aim to prepare individuals to become technicians, typically at an educational level above high school but not reaching the level of a degree (Singh, 2013). Polytechnics throughout the country are offering three-year extensive programs in conventional fields like civil, mechanical and electrical engineering. Over time, these programs have evolved to include additional fields such as computer science, electronics, hospital engineering, medical lab technology, and various other fields (Kang, 2001). The Ministry of Labour and Employment (MOLE) and the Ministry of Human Resource Development (MHRD) are the two central government agencies that have the authority to oversee formal skill education in the state (Chattopadhyay, 2011). Polytechnic institutions in India are managed both at the state and national levels. At the national level, they are overseen by the AICTE, which operates according to the directions of the Ministry of Higher Education, and at the position of the state, it is managed by state boards.

A balance needs to be struck in developing TVET programs, aligning them with the specific needs of local employers while maintaining a sustainable vision for the long-term local economy. In regions facing a "low skills trap," special attention is crucial for those areas demonstrating an inclination towards higher value production or the utilisation of more skilled workers. Additionally, areas that may pose some risk should be carefully considered, as they could impede their capacity to support dynamic economic development (OECD, 2016).

## 2. The Crux of Earlier Literature

**Mehrotra et al. (2014)** investigated the scarcity of adequately trained youth in India compared to other nations. The prevailing skill gaps account for this, with only 2 per cent of the working people formally possessing skills and a mere 2.4 per cent having received little technical education. Their initial survey utilised a sectoral approach, concentrating on four key sectors: electronics, IT, automobiles, and chemicals, spread across four economically active cities in the state. The research reveals that small enterprises primarily contend with competition in low-end skills, such as electricians and fitters. In contrast, larger firms grapple with the predominant challenge of ensuring the quality of skills. A prevalent issue in vocational education and training is the noticeable gap between theoretical knowledge and practical application, necessitating resolution. Many companies have implemented training programs within their premises to address these skill gaps, while others rely on on-the-job training for recruits.

In his study, **Damodaran (2008)** underscores the performance of markets and discusses the mismatch between demand and supply. He highlights that India is ensnared in a deficiency of high-quality skills, adversely impacting productivity, growth, and investment. There is an urgent need to impart skills to 20 million people by 2015. To improve employment prospects, it is crucial to cultivate a skilled workforce and elevate the level of education, ultimately leading to increased wages. Technical education performs a crucial role in fostering the economic betterment of any state.

According to **Adams (2012)**, various skill development initiatives significantly influence earnings and employment outcomes. Possessing skills increases the likelihood of individuals securing employment promptly after leaving school, and once integrated into the workforce, they demonstrate higher productivity and adaptability. The efficacy of Vocational and Technical Education (VTE) is heightened when it specifically

addresses the skills demanded by the job market. This shift in perspective aligns closely with market dynamics, moving away from training systems driven by supply. Technical education and training programs are crucial in generating job opportunities, particularly for young women. Private sector involvement is essential to ensure financial support and effective skills training. However, certain policy distortions and market failures may impede the private sector's capacity to fulfil these roles in few instances. In these situations, government support is required to address market shortcomings and advance skill development. This emphasizes how important it is for the public and private sectors to work together to guarantee the success of skill development initiatives and the generation of job opportunities.

**Bhurtel (2015)** argues that TVET is important for enhancing competence as it concentrates on specific skill sets and jobs. By attaining the needed expertise, learners can start their own work or can get the required job quite easily that complements their training. Technical institutes perform an important role in the economic betterment of the state by improving its workers, by doing this employment will be increased. TVET works for a dual objective by improving self-employment and employment labour market situations, specifically in places where job chances are less and the main industry is agricultural operations. Multinational corporations look for employable abilities in local labour, taking into account the market, natural resources, and labour capacity of the nation. TVET equips individuals with the necessary skills required by these companies. The study demonstrates that TVET facilitates higher mobility among individuals, enhancing employment opportunities and enabling the transfer of technology and skills, making individuals competent for various jobs. TVET plays a critical part in addressing the challenges of an unskilled workforce and unemployment in developing countries. Many Asian countries, heavily reliant on remittances, require technical education to prepare their population for employment abroad. The study underscores the importance of TVET in offering a solution to the persistent problem of increasing unemployment in the face of a growing population. Self-employment, facilitated by TVET, emerges as a critical strategy to alleviate unemployment.

**Husain et al. (2010)** investigated the importance of skills required for engineering graduates' employability from the employers' perspective. The study involved 180 employers across various engineering sectors in Malaysia, using a tool adapted from the SCANS model. The research found no significant differences in employability skills concerning the company's size. However, substantial variations were observed in the graduates' general, and technology-related skills. The findings highlight the considerable emphasis placed on employability skills for graduates from the employer's standpoint. Employers, particularly in electrical, civil, and mechanical engineering sectors, consider these skills essential for students to compete effectively in international markets. The study suggests that educational institutions should play a key role in enhancing students' employability skills, utilising methods such as curriculum development, co-curricular activities, and the professional development of lecturers.

According to **Okoye and Chijioke (2014)**, TVET is seen as the vital component of inculcating employability competence and skills that enhance labour output both internationally and nationally. The research tries to see how much TVET courses of the state performed to correct the current economic productivity problems at the international level. While some states require training facilities in schools, others offer post-school training to graduates. Remarkably, those who have implemented these initiatives have grown the GDP, established a highly skilled labour force, and attained economic stability. The study posits that an enhancement in the TVET system can lead to a disciplined society, poverty eradication, decreased unemployment rates, and wealth generation within the state. To optimise the TVET system, the study recommends compulsory internship or apprenticeship skills training for graduate students. Furthermore, it advocates for dedicated efforts by educators to connect technology theories and mathematical principles to real-life scenarios, aligning with learners' environments. By employing these strategies, the learning environment can become more conducive to skill acquisition, scientifically oriented, and highly effective. Collaboration among industries, schools, and experts is encouraged, emphasising the classification of workers based on knowledge and individual skills rather than solely on academic scores.

**Ayonmike and Okeke (2016)** show that the skills possessed by vocational education students related to employability pose a significant concern for the state. Representatives from the labour markets perceive Nigerian students as only partially prepared for employment, lacking sufficient employability skills, rendering them unemployable. The study employed a questionnaire, and the Cronbach alpha technique was utilised to validate the study's reliability. Data analysis involved using percentages and simple frequency counts. The research underscores that collaboration between institutions and industries is essential to address skill gaps and reduce unemployment among vocational education graduates. The establishment of partnerships at the workplaces, like staff exchange facilities, vocational skills centres creation, and resource sharing, is recommended as the tools for target achievement. The research recommends that to improve the skill sets of students, agencies of the state, associations of business and education institutes need to cooperate. For enhancing the employability of pupils of vocational institutes, steps like the vocational skills centres creation, development and entrepreneurship training, after course completion job prospects and the supply of soft loans,

are suggested. The research throws light on the significance of reforms in technical education and lays stresses on the requirement for alteration in the curriculum to fill in skill gaps. There is a need to frame curricula that cope fast with labour market changes and the ever-changing requirements of employers. Keeping in mind the labour market and the company's demand the curriculum must be modified immediately.

In 2013, **Mehrotra and Ghosh** put forward the issue of national training fund creation. The thinking behind this thought is increasing the requirement for skill improvement and the need for a funding system at the central level supervised by the state. Recognising the limitations of the existing firm-level training system, which has proven ineffective and prone to a "free rider problem," the proposal suggests diverse sources of financial support and state funding to promote skill development. The study strongly urges policymakers to seriously consider implementing a national training fund, emphasising that India should adopt fundraising and levy disbursement programs to support skill development initiatives effectively.

**Sanghi and Sarija (2015)** emphasised the importance of the connection between productivity, employment prospects, and skill development. The correlation between productivity and skills proved beneficial for different population segments. The research demonstrated a direct correlation between skill development and poverty reduction. The study provided recommendations for enhancing the education status of the workforce, expanding reach to the training of high-quality employment opportunities, coordinating stakeholders, fortifying the framework for skill delivery, defining key performance indicators with a focus on outcomes, encouraging increased participation from the private sector, implementing systematic reforms, and ensuring the availability of necessary funding resources.

**Al-Ali (1993)** researched VTE in Kuwait and observed that the dearth of trained and semi-skilled people has a big impact on various sectors. Even though the country has considerable resources and it acknowledges the importance of technical education and skills. The study reveals that Kuwait's Technical and Vocational Education (TVE) system doesn't meet expectations.

**Cong and Wang (2012)** highlight that TVET is important for job prospects increment, accelerating economic growth, and enhancing the calibre of the job. They furnish details about how over time TVET has developed, chiefly concerning how amazingly it has modified itself according to present economic and social conditions. In the era of economic and social changes, cooperation among vocational institutes and industrial businesses has turned out to be a potent tool for the betterment of technical education. To ensure that Vocational and Technical Education (VTE) continues to advance, qualified educators must be developed. Additionally, integrating Information and Communication Technology (ICT) has introduced diverse experiences and activities supporting vocational education, potentially revolutionising its delivery and experience. In essence, the continuous reforms in TVET aim to enhance its adaptability to societal and economic changes, ensuring its responsiveness to evolving needs and requirements.

### 3. Conclusion and Suggestions:

The study tries to evaluate the growth of polytechnics in India and abroad. It shows the relevance of technical education for developing essential skills and improving the employability levels of technical education pass-out students. Most of the studies show that technical education is mandatory to improve the skill structure of the country's residents and for the overall development of any country. Following are some of the crucial suggestions provided by various studies:

1. Technical and vocational education is the basis for enhancing the employability skills of the people residing in any nation.
2. To address the skill gaps, TVE is essential.
3. Employability skills should be kept in mind while teaching various courses; this can improve the chances of employment opportunities for pass-out students.
4. Finance is essential for the smooth functioning of any education system; a training fund needs to be established to finance technical education in our country.
5. There is an urgent need to establish proximity between industry and technical education institutes to frame appropriate policies related to technical training according to the current needs of society.
6. Private sector involvement in financing and providing skills training is essential. However, in some cases, the private sector may not fulfil these roles due to policy distortions and market failures. In such situations, government funding becomes necessary to address market failures and promote skill development.
7. For better employment opportunities, we should have a skilled workforce and a higher education level that will also boost wages. Technical education is significant in enhancing the economic development of any nation.

8. A gap between practical and theory should be resolved. Many firms have training programs in the factory premises to bridge the skill gaps, and many other firms look for on-the-job training for newcomers.
9. The effectiveness of technical and vocational education is heightened when it focuses on competence demanded by the job market. This shift in perspective is closely aligned with market dynamics, as opposed to supply-driven training systems.
10. The curriculum of technical educational institutes needs to be upgraded regularly according to the needs.
11. Efforts must be made to increase the number of enrolled students in technical educational institutes, especially polytechnics.
12. Teachers must be regularly updated in skills, knowledge, and teaching methods. Seminars, workshops, and conferences needed to be arranged for them.

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