

REVIEW ARTICLE

Historical developments and current situation of technical and vocational education in Pakistan

Muhammad Azeem Ashraf*, Qiqi Xu, Linfang Xiang

Institute of Educational Sciences, Hunan University, Changsha 410082, Hunan Province, China

ABSTRACT

Technical and vocational education and training (TVET) is essential worldwide due to its prominent role in preparing the skilled workforce to participate in economic development. This article reports on the TVET situation in Pakistan. First, it reports the historical developments of TVET in Pakistan. TVET has been given priority in policy documents since the independence of Pakistan, but real practical work has been done in the last two decades. National and provincial governments have formulated many new policies to improve TVET and created new governing authorities to regulate it. This results in increased TVET institutions and enrollments. However, this article also identified the significant challenges to TVET in Pakistan. Governance and infrastructure problems, gender inequality, and quality of teaching and learning are three critical challenges to developing TVET. National and provincial governments should partner with local industry and international organizations to build a better framework for TVET in Pakistan.

Key words: technical education, vocational education, technical and vocational education and training, Pakistan

INTRODUCTION

The ability of technical and vocational education and training (TVET) to support countries in improving and transforming societies is extensively acknowledged.^[1] TVET provides opportunities for individuals to learn the necessary skills for work and increase their professional efficiency across various industries. TVET is mostly imagined as learning for work, and it has been given priority in most developed and developing countries. Many educational systems worldwide have started linking the TVET with formal education systems to teach students theoretical and practical knowledge. The European Union signified it is necessary for economic growth, sustainable development, and international competitiveness.^[2,3] It also supports young people's options in entrepreneurship and self-employment.

TVET witnessed different social attitudes towards its

importance in social and national development. For example, TVET had been seen as less essential and had a low status by the public, and most TVET institutions were unfamiliar.^[4] However, it has gained importance recently, and the number of institutes and enrolments has increased. The students and parents find TVET essential and helpful in their future careers.^[1] One reason for this change is improving TVET in national and international policy documents. Many global organizations have formulated guidelines and frameworks for countries to develop a better TVET system. For example, United Nations Educational, Scientific, and Cultural Organization (UNESCO) has built a separate database for TVET education to store the policy, framework, research reports, and country-specific documents.^[5] Most countries worldwide have started developing improved and better TVET systems, however, their development is limited in developing countries.

*Corresponding Author:

Muhammad Azeem Ashraf, Institute of Educational Sciences, Hunan University, Lu Shan South Road, Yuelu District, Changsha 410082, Hunan Province, China.

Email: azeem20037@gmail.com; <https://orcid.org/0000-0003-0133-4056>

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TVET in Pakistan has also witnessed a diverse path of development.^[6] It was neglected by the government and public in the past and started giving importance to TVET at the beginning of the 21st century. It is considered an essential factor in producing a skilled labor force.^[7] Pakistan faces different challenges in skills development, and most of the workforce is trained through other informal education systems.^[8] Pakistan has excellent human resource ability as over 50% of its population is below 30. The large number of youth is considered a valuable resource for developing Pakistan's economy and fulfilling international demands by sending a more skilled workforce.

The debate on TVET in Pakistan is new, and most policy formulation and practical implementation of policies were completed in the last two decades. The government started many initiatives and support programs to engage young people in training and enable their contributions to economic growth.^[9] Thus, this article aims to analyze TVET in Pakistan. First, it explores the historical developments of TVET, then examines the government initiatives to support TVET in Pakistan, and finally, it reports the challenges to TVET in Pakistan.

HISTORICAL DEVELOPMENT OF TVET IN PAKISTAN

TVET education from 1947 to 1999

The education system in Pakistan after its independence in 1947 was deeply influenced by the colonial period, and the development of various industries relied on many foreign technical personnel for guidance. The national leadership recognizes the importance of technical education and vocational training for social reconstruction. Pakistan's founding father, Muhammad Ali Jinnah, has also emphasized the role of vocational education in promoting economic development on various occasions.^[10] He suggested that education development should be combined with local communities and social conditions, establishing a direction for its development.

After independence, the government realized it was necessary to develop a better education system to improve people's living standards. The 1959 Report of the National Education Commission, as a comprehensive education policy document, emphasized the importance of education for national development, proposed incorporating technical education into the national education system, offering diversified subject courses, and cultivating technical personnel for different industries every year to meet the needs of industrial development at that time.^[11] The report highlights the role of vocational education in national development

and has planned many specific goals. Although most have not been achieved, they have laid the foundation for forming Pakistan's vocational education system.

The Ayub Khan government issued a landmark "Apprenticeship Regulations of 1962" to cultivate skilled technical personnel and standardize apprenticeship training.^[12] The regulations pointed out that "apprenticeship" refers to a training system in which employers promise to train or systematically train apprentices, and apprentices must serve employers during the training period. In the 1970s, the oil economy of Middle Eastern countries developed rapidly, and many laborers in Pakistan began to work in the Middle East. As a result, many short-term vocational education programs emerged, aimed at training technical workers who met the skills standards of overseas labor markets and increasing Pakistan's foreign exchange income. The scale of vocational education in this stage is also expanding daily, and the standardization, modularization, and standardization of vocational education development are gradually receiving attention from the government. The 1970 education policy continued to promote the transformation of secondary education towards vocational and technical education, emphasizing the selection and training of excellent vocational education teachers and encouraging private institutions to provide various short-term training courses for semi-skilled and skilled workers.^[11] To attract more students, the policy even suggests that federal and provincial governments offer 75% scholarships to students registered in vocational education. Due to various factors, the professionalization reform of secondary education in Pakistan has faced numerous difficulties. Education policies have not explicitly been implemented, and most specific goals have not been achieved.

In the history of TVET in Pakistan, a significant shift from general education to the concept of the "world of work" was proposed in the 1972-1980 defined education policy. Consequently, home economics, agriculture, and agro-technical courses were introduced into urban and rural communities nationwide.^[13] With financial assistance from several foreign donor organizations, Pakistan's TVET industry also saw notable growth and expansion in the 1970s and 1990s. Faced with the new situation and requirements of vocational training development both domestically and internationally, the Pakistani government formulated the National Training Regulations in 1980, establishing the National Training Commission and Provincial Training Committees.

In the 1990s, the Nawaz Sharif government issued two education policies, continuing to focus on the development of vocational education and launching many new vocational training and technical education projects, such as training women in nontraditional

industries, increasing employer participation in vocational training, and establishing the National Institute of Science and Technology Education (NISTE) to train teachers in science and technology education. In 1999, a milestone in developing TVET education in Pakistan was the formation of the Technical Education and Vocational Training Authority (TEVTA). The primary goals of TEVTA's founding were to raise educational standards *via* creative reforms and to align TVET with the demands of the labor market. TEVTA's functions include overseeing and coordinating the efficient operation of institutions, approving development projects, acquiring and installing equipment for the institutions, updating and revising curriculum, and setting up on-the-job training for trainees at the institutes.^[14] The workforce of Punjab is said to possess relatively low skill levels and be less equipped to compete in the modern, globalized world.

Figure 1 illustrates the number of TVET institutions in Pakistan from 1947 to 1999. The number of TVET institutions increased slowly from 1947 to 1972.^[15] During this period, the government formulated many policies, but most were never implemented, so the number of institutions has not significantly increased. After that, it experienced exponential growth from 1986 to 1988. The number of TVET institutions reached its highest level in 1988, but it is still less than one thousand. From 1989 to 1993, it decreased rapidly, and the quantity remained stable after 1994.

Figure 2 shows the number of enrolments in TVET from 1947 to 1999. Over the past fifty years, the number of enrolments remained very low. From 1947 to 1972, the enrolment was less than fifty thousand. In 1988, enrollment reached 123,000 which was the highest level before the year 2000. The number of enrolments did not show good development prospects. The low enrolment of TVET institutions indicates that there is neither a demand from parents nor a strengthening of the educational quality of the TVET institutions to match the demands of the labor market. These demand factors suggest that TVET institutions need to meet the demands of the labor market. Similarly, the insufficient capacity of vocational and technical education and training institutions is also one of the factors that cannot simultaneously provide both the quantity and quality of graduates.

Another critical factor of TVET education is teachers. The number of teachers increased with the growth of TVET institutions. Figure 3 shows the number of teachers in TVET institutions in Pakistan from 1947 to 1999. The number of teachers in TVET institutions is more significant than that of enrolment. The number of teachers in TVET institutions reached 1499 in 1963. It still increased from the 1960s to the 1980s. In 1987,

there were over 9000 teachers in TVET institutions in Pakistan. The number of teachers in TVET institutions fluctuates slightly, just like that of enrolment and institutions.

21st century transformations in TVET in Pakistan (2000-2021)

Although Pakistan possesses a substantial labor force, however, it is not well trained. Consequently, enhancing the workforce's knowledge and skills to align with contemporary societal demands constitutes the long-term educational objective in Pakistan. TVET in Pakistan has garnered significant attention to align with evolving industry needs and address unemployment. With the start of the 21st century, the government significantly contributed to advancing TVET in Pakistan. The government has implemented numerous reforms to enhance the quality, efficiency, and practicality of TVET.^[16] The federal and provincial governments of Pakistan oversee education and vocational training systems. The Federal Ministry of Education and Professional Training makes policy decisions. The National Vocational Technical Education Commission (NAVTEC) was established in 2005 as a governing body to regulate TVET education in Pakistan and link the different stakeholders. Each province has established separate TEVTA authorities to regulate and monitor TVET education.

The government significantly emphasizes TVET in Pakistan by developing better frameworks and modernized curricula. There has been a discernible transition towards prioritizing practical and hands-on training in TVET facilities. Moreover, the modernization of TVET course content is designed to equip learners with the necessary knowledge, skills, and attitudes to excel in a competitive job market. The curriculum is transitioning towards competency-based education, emphasizing the development of practical abilities and enhancing training in emerging technologies, digital skills, and soft skills.

In addition, TVET in Pakistan has improved collaboration between the government, private sector, and international institutions. Governments at national and provincial levels played a crucial role in formulating policies, regulations, and frameworks. The government improved financial and resource aid, collaborating with different authorities through various ministries to address regional needs. The private sector provided students with internships, apprenticeships, and on-the-job training, enabling them to acquire practical experience and exposure to real-world work environments. Private companies also contributed to the development of TVET. International organizations, donor agencies, and development partners offered

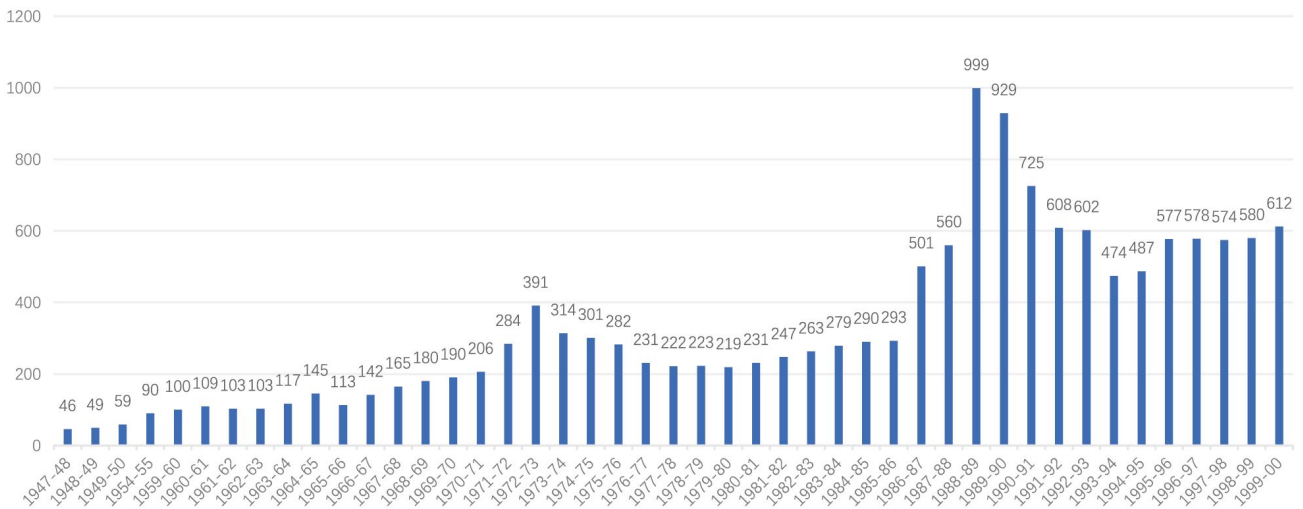


Figure 1. Number of TVET institutions in Pakistan (1947-1999).^[15] TVET, technical and vocational education and training.

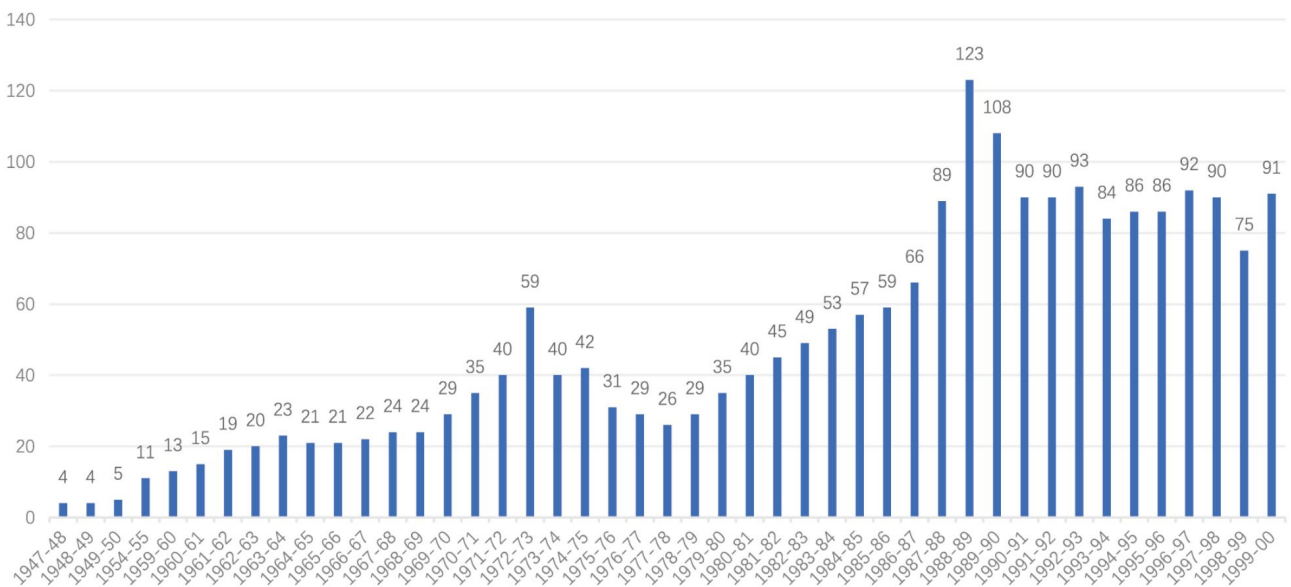


Figure 2. Number of enrolments in TVET institutions in Pakistan (in thousands, 1947-1999).^[15] TVET, technical and vocational education and training.

technical assistance, expertise, and funding to fortify Pakistan's TVET system. By fostering cooperation between the government, private sector, and international institutions, the TVET sector in Pakistan can more effectively address the skills gap and contribute to economic growth.

The expansion of TVET institutions in Pakistan has increased the demand for students and teachers. The growth of TVET institutions in Pakistan is occurring nationwide, encompassing a broad spectrum of skill sets, including healthcare, agriculture, construction, and

information technology. The expansion of these institutions has led to a substantial enhancement of educational opportunities in impoverished areas. Figure 4 represents the number of TVET institutions in Pakistan from 2000 to 2021. Since 2005, there has been a significant increase in the number of TVET institutions in Pakistan, escalating from 747 to 3059.^[15] This growth has been consistent over the years, indicating a steady rise in the demand for such educational facilities.

Similarly, with the increased number of TVET

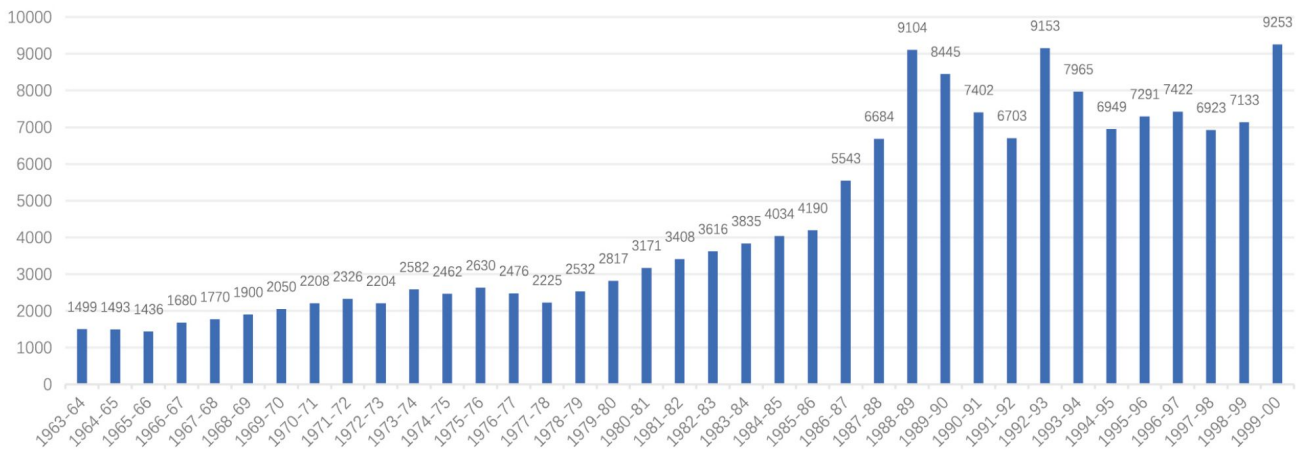


Figure 3. Number of TVET teachers in TVET institutions in Pakistan (1947-1999).^[15] TVET, technical and vocational education and training.

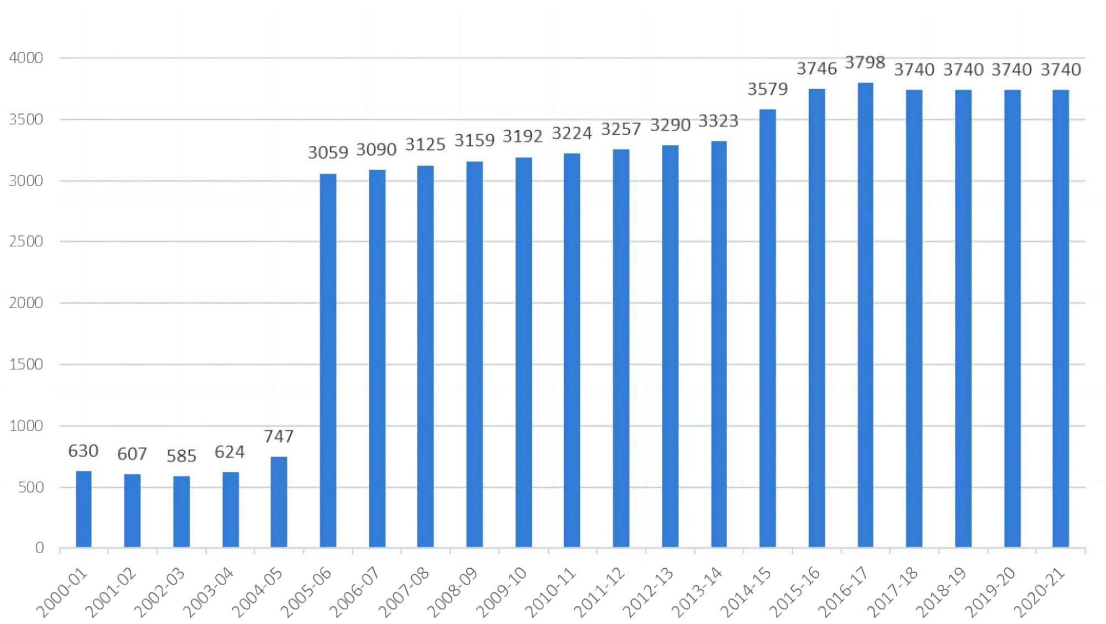


Figure 4. Number of TVET institutions in Pakistan (2000-2021).^[15] TVET, technical and vocational education and training.

institutions, enrolment also increased, indicating a growing recognition of the importance of practical skills and hands-on training. This trend could lead to a more skilled workforce and contribute to economic development. Figure 5 depicts the enrolment in TVET institutions in Pakistan from 2000 to 2021. Over the past 15 years, a consistent rise in enrollments has been observed, culminating in a total enrollment of 433,000 students in 2017.

With the increase of TVET institutions and students, the demand for teachers is also rising. Figure 6 depicts the number of teachers in these TVET institutions in Pakistan from 2000 to 2021. Before 2005, the total

number of TVET teachers in Pakistan did not exceed 10,000, rising to 14,565 in 2005 and increasing more slowly, reaching a peak of 19,393 in 2014.

GOVERNMENT INITIATIVES TO PROMOTE TVET IN THE 21ST CENTURY

National TVET policy

The Federal Ministry of Education and Professional Education began working in March 2015 on a national policy for TVET.^[17] A task team comprised government, employers, and TVET representatives, who were widely consulted to prepare the policy. Since then, the proposed strategy has undergone further comment and

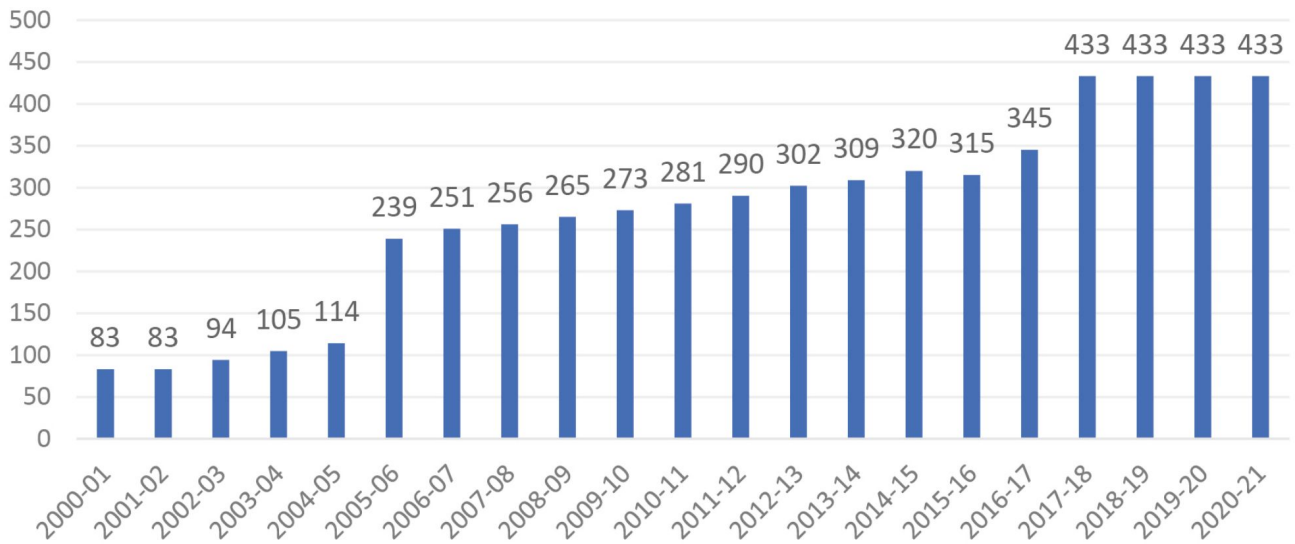


Figure 5. Number of enrolment (in thousands) in TVET institutions in Pakistan (2000-2021).^[15] TVET, technical and vocational education and training.

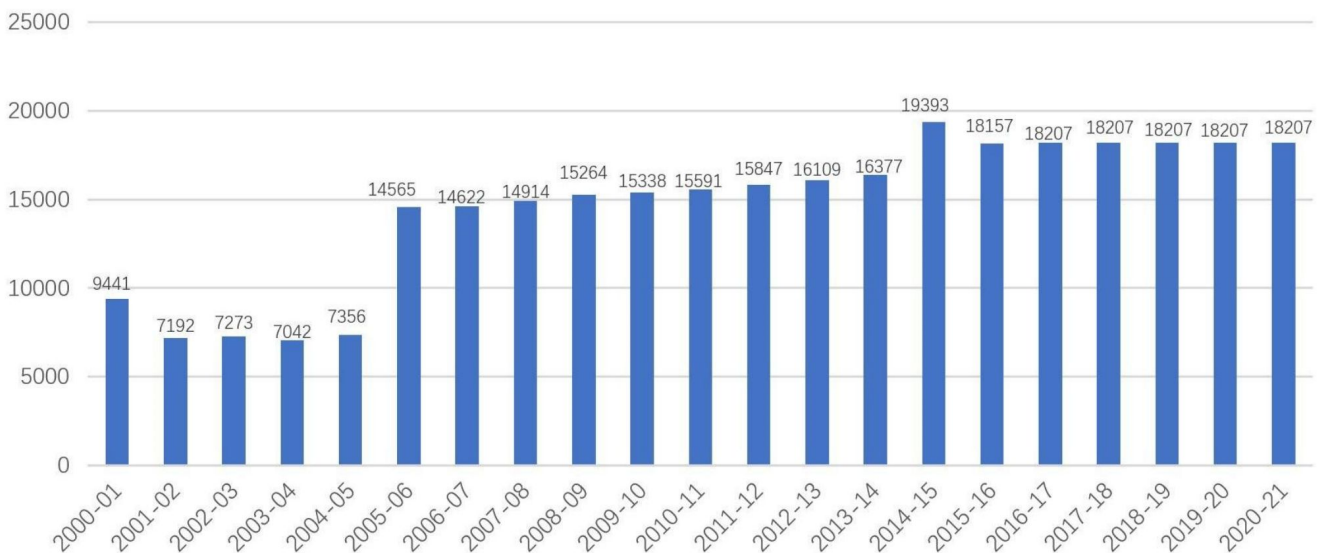


Figure 6. Number of TVET teachers in TVET institutions in Pakistan (2000-2021).^[15] TVET, technical and vocational education and training.

debate. The national TVET policy is centered on eight objectives: national commitment to the importance of TVET, increase in the number and quality of training, setting national standards, competency-based education, new partnerships with public and private sectors, export of skilled labor, linkage with the informal sector, and continue reforms and revitalization of TVET.

The TVET Policy is a significant commitment made by the Pakistani government for the first time in its history. The policy aimed to invest in skills development essential for meeting the demands of the rapidly

changing global economy. To achieve this, the policy emphasized increasing access to basic education, improving quality, and enhancing higher education. The main aim of the policy is to develop the necessary skills to make Pakistan more efficient and competitive domestically and internationally. The policy demanded complete determination to implement TVET policies to provide technical and vocational education for domestic and international labor markets. National TVET policy achieved its objectives through several actions, such as clarifying national and provincial roles, introducing a National Vocational Qualifications Framework and

Quality Assurance System, encouraging and supporting private sector involvement, and supporting TVET and general education links.

The main goals of the national TVET policy are beneficial to the government, employers, trade unions, education and training providers, and students. Society must take TVET seriously and prioritize TVET education in investment and fund allocation decisions. Advancements in the design and delivery of training programs since 2015 have helped increase knowledge and experience of good practices in Pakistan. There is a growing recognition of the need to enhance the country's human capital, particularly by developing the skills required to grow and sustain the economy. The policy sets out a long-term vision. It establishes a framework to guide operational strategies and plans, outlining objectives and principles that serve as a unifying force for government, employers, workers, and training providers.

National skills strategy

The Pakistani government made skills development a political priority to achieve sustained economic and social development, remain globally competitive, and respond to changes in technology and work patterns. The NAVTEC has developed a policy document titled *Skilling Pakistan: National Skills Strategy 2009-2013 (NSS-1)*, an indicator for developing TVET education in Pakistan. The NSS-1 was developed through 18 months of coordination and extensive consultation with various stakeholders, including local and international experts, relevant ministries, provincial governments, training providers, trainees, private sector associations, and chambers of commerce.

The NSS-1 proposed a paradigm shift from curriculum-based education to competency-based training. It anticipated providing relevant industrial and economic development skills through a comprehensive approach, improving opportunities, equality, and employability, and ensuring quality. Twenty strategic measures were proposed to transform this vision into a feasible national strategy for reform. Its main task was to provide the public and private sectors with policy direction, support, and an enabling environment to implement training for skills development to enhance social and economic profile. The NSS-1 aimed to establish a framework for skills development that brings about two major shifts: one is a move from time-bound, curriculum-oriented training to flexible, competency-based training, and the other is a shift from supply-oriented training to demand-driven skill development by encouraging industry involvement in the design and delivery of TVET. The proposed paradigm shifts were required to achieve three main objectives: first, providing relevant skills for

industrial and economic development; second, improving access, equity, and employability; third, assuring quality.

Recently, the government of Pakistan formulated a second strategy, the *National Skills for All Strategy: A Roadmap for Skill Development in Pakistan 2018 (NSS-2)*. This strategy document outlined a framework for improving eight critical TVET areas in Pakistan.^[8] It suggested specific roles for national and provincial governments in planning, standard setting, and quality assurance. It guides funding allocations for the TVET sector and improves capacity enhancement. It also provides all citizens with a framework for quality assurance, access, and equity. Moreover, it gives directions for more industry involvement and skill development for national and international markets.

Prime Minister's youth skill development program (PMYSDP)

PMYSDP was started to strengthen TVET quality. The program aims to equip young people with market-driven conventional and high-tech skills required for career progression, bringing youth capacity to par with international standards. In addition, the implementation of this program also aimed to reduce poverty, increase employment opportunities, provide skilled labor for large, medium, and small industries, and meet the needs of the international labor market, providing skills development training for unemployed youth from low- and middle-income families.

PMYSDP is a critical way to empower young people, harness their human development potential, and change Pakistan's future. The program comprises several interventions to stimulate the transformation of the entire TVET system in the country. There are 13 components of this program, including high-tech skills, conventional skill development, apprenticeship training, national accreditation, international accreditation, recognition of prior learning, facilitation centers, standardization of TVET, smart tech labs, labs in Madrassas, accreditation council, teachers training, and so on.

The 2018 Prime Minister's Youth Skills Development Plan (Phase 5) was launched to provide financial support to students from deserving families and is expected to achieve some accomplishments. More than 25,000 young people, including 35% girls, receive training in demand-driven industries nationwide. This training was expected to eliminate poverty and provide employment opportunities for young people in Pakistan. All young people who meet the program's requirements can apply to participate and become candidates. For example, the age limit is 18 to 35, and candidates must have a middle

school certificate.

TVET sector support programme

The TVET sector support programme, an essential initiative in Pakistan, has significantly contributed to enhancing the overall quality and effectiveness of TVET in the country. This program typically involves cooperative efforts between governments, development partners, and other stakeholders to improve learning outcomes for students and trainees. It modernizes and upgrades TVET institutions fosters collaboration between TVET providers and industry to address the needs of the labor market, and creates a favorable learning environment. Concurrently, the program adapts and updates TVET training courses following industry requirements and standards, provides professional development opportunities for TVET teachers, enhances their teaching skills, and offers career guidance and counseling for students to assist them in making informed decisions regarding their education and career trajectories.

Skill verification program

The skill verification program is typically executed as part of a broader initiative to evaluate and authenticate an individual's competencies across various domains. This program is intended to acknowledge and certify workers who have obtained skills through informal or nontraditional channels, such as apprenticeships, on-the-job training, or self-study. Specifically, This program requires individuals to undergo assessments or exams to determine their proficiency in specific skills or vocational competencies. Successful candidates will be bestowed with an official certification or certificate, ensuring that the certified abilities align with the demands of the industry and sector. The skill verification program in Pakistan aims to bridge the gap between formal education and the workforce's needs, foster lifelong learning, and issue individuals with recognized certificates that showcase their abilities.

Matric-Tech program

The Matric-Tech program aims to integrate TVET with traditional high school (Grade 10) studies to address the challenges of educational standards and skills development in Pakistan. This program was designed to provide students with practical skills needed in the labor market, laying the foundation for better access to higher education and the labor market. The program focuses on developing skills related to specific industries or fields, such as automotive repair, electrical engineering, plumbing, woodworking, computer programming, or electronics. Thus, it is planned to strengthen cooperation with industry partners, enabling students to gain relevant practical experience through internships, apprenticeships, or on-the-job training, thereby enhancing their

employability. A dual curriculum is implemented in the course design, combining theoretical knowledge and practical skills. Students follow a program that combines academic subjects with technical and vocational training; those who complete this program will receive industry certification or qualification.

CHALLENGES TO TVET IN PAKISTAN

Problems in governance and infrastructure

The analysis shows that TVET has witnessed significant development since the independence of Pakistan. This development was boosted at the beginning of the 21st century. Governments have established new governing institutions to create a sustainable and productive infrastructure for TVET in Pakistan. The government also issued new policies to improve TVET education. However, there is still a gap in governance, policy, and investment in TVET to provide advanced training. The Federal Ministry of Education and Professional Training manages the policy planning and guidance for TVET in Pakistan. However, some policy activities are formulated by the Ministry of Agriculture, Ministries of Industries, Ministries of Labor, and Manpower at federal and provincial levels. National Vocational and Technical Training Commission (NAVTTTC) mainly regulates and facilitates TVET education. It primarily provides linkage space for regional, national, and international stakeholders. Each province has established its regulatory authorities to manage and regulate TVET education. Recent research on TVET education in Pakistan showed a potential gap in the policy direction for TVET and the clear directions and definitions of leading roles by different regulatory authorities. Another issue is the financing, as no special funding has been allocated for TVET. All financing for TVET is allocated together with formal education. Even though NAVTTTC and provincial authorities have found different financial resources from international agencies, national industries, and the private sector, the financial allocation and policy guidelines are still poorly explained.^[18]

The Asian Development Bank's report on the TVET situation also mentioned several weaknesses in the TVET policy and institutional framework in Punjab, which were similar to other provinces.^[19] This report indicated that the TVET institutes face management challenges, weak relationships with different stakeholders, and less communication between provincial TVET agencies. These constraints prevent TVET institutions from building a consensus on national and provincial TVET strategies, attracting donor funding, and learning from their best practices.

The other concern is the quality of infrastructure in TVET education. NAVTTTC analyzed the status and

conditions of infrastructure available in TVET education in Pakistan.^[20] Their analysis showed that only 58.0% of buildings had sufficient facilities for students and teachers, while 23.0% were marked as partially satisfactory. The rest of the buildings were marked as inadequate, which means they did not have sufficient resources for students and teachers. This analysis becomes more of a concern when infrastructure among regions is compared. In Islamabad, the capital city of Pakistan, 42.5% of buildings were marked partially satisfactory, which shows excellent weakness in TVET education. In their report, only Punjab province showed better infrastructure for TVET education, with 78.7% of buildings satisfactory for students and teachers. However, in addition to learning and teaching infrastructure, very few institutions provide hostel facilities to their students. That means students from other regions will have to find accommodations outside of the institutions.

Gender inequalities

Equal participation of the male and female population in economic activities is crucial for a country to advance its economy and the collective wealth of its people. However, female participation in economic activities is still limited in Pakistan.^[21] Recent developments in TVET in Pakistan showed some progress in increasing female participation. All policy and legal documents formulated by government and non-government institutions prioritized women's participation in TVET and aimed at giving full access to TVET. All policy documents formulated by national and provincial governments prioritized women's access to TVET. The National Vocational Qualifications Framework (NVQF) standardized the TVET qualifications for all institutes in the country and provided a framework to improve gender inequality in TVET.^[22] The national government initiated a special loan scheme for young women to start businesses. In addition, the government also fixed the 10% quota for women in employment at the majority of government institutions. Like the national government, all provincial governments formulated TVET authorities to promote equal participation for women.

All these initiatives have improved women's participation in the TVET. For example, there were only over two hundred TVET institutions in 2000. However, more than one thousand institutions have been established in Pakistan to provide TVET education to women. The women's enrollment in TVET increased to over one hundred thousand in 2017 and only fourteen thousand in 2001.^[23,24] The number of female teachers working in TVET has also increased in the last two decades. There were only about two thousand teachers, which increased to four thousand in 2017. These figures show some promising progress in improving women's

participation in TVET.

However, this progress is insufficient compared to the number of institutions, teachers, and enrollment for males. Still, the number of women in TVET is less than that of males. Table 1 shows that the number of female institutes is over one thousand, compared to male institutes, which are more than 3000. The male enrollment is also higher than the female enrollment. Similarly, the number of male teachers in TVET is two times higher than that of female teachers in TVET. This analysis shows that the number of females who participated in TVET is still limited, and more efforts are required from governmental and societal levels.

In addition to less access to TVET, most women in TVET are enrolled in traditional female courses such as cooking, beauty therapy, baking, dressmaking, and food preservation. Women's enrollment in technical programs such as engineering is very low. Previous studies marked different social barriers that have limited women's participation in specific disciplines. For example, a study found that women are encouraged by family members to pick professions that they can work from their own homes.^[25] The safe and secure environment was another factor mentioned by research. Parents were unwilling to send their female children to institutes far from their homes.

Women's participation in the labor force after formal and informal training is another major concern that should be examined. According to labor force surveys in Pakistan, the country's female labor force participation is around 23%, one of the lowest compared to other countries in the region. Most of the labor is working in the agricultural sector on daily wages. The most employed women work in the medical profession. However, more than 60% of female in the medical field leave their work after marriage. Similarly, more than 70% of female graduates from universities stay home after marriage, and even below 10% of women start their businesses.

Thus, gender inequality is a significant concern for TVET education in Pakistan. More efforts from the government and society are needed to increase women's participation in TVET so that they can contribute to the country's economy. A recent report by the International Monetary Fund suggested that Pakistan's gross domestic product (GDP) can be increased by 30% by ending gender gaps in economic contribution.^[21] Thus, more efforts are needed to increase women's participation in economic growth.

Quality of learning and teaching

TVET education's third challenge is the quality of learning and teaching. The issue is continuously

Table 1: Gender inequality in TVET in Pakistan

Item	Year 2001		Year 2017-18	
	Male	Female	Male	Female
Number of TVET institutes	630	236	3797	1370
Enrollments	14,000	121,000	358,000	121,000
Number of teachers in TVET	9441	1959	18,885	4043
Labor force (percentage)	83.3	16.0	80.3	22.0

Data source: public work paper.^[23,24] TVET, technical and vocational education and training.

mentioned in government documents and non-governmental organizations' research reports. All policy documents issued by the national and provincial governments emphasized the quality of teaching in professional and technical courses. However, it is still a significant concern for the quality of TVET education in Pakistan.^[26] The majority of the issues are related to the quality and competencies of teachers to manage professional and more advanced courses. The study on teachers in TVET education found that many teachers had difficulty managing professional courses.^[27] The majority of teachers were focusing on theoretical teaching. However, TVET education requires more practical and skilled-based knowledge. There was a lack of guidelines and training for teachers to teach more professional courses.^[28] In addition, the recent few years have witnessed significant advancement in technology. Almost all professions are trying to adopt technology so that they can improve the work performance of employees as well as produce more in less time. However, the lack of professional training and guidelines made it very difficult for teachers to train the students with the most advanced knowledge in their field. In addition, most teachers followed traditional methods to teach the courses, limiting students' learning skills.

Secondly, most teachers working in the TVET institutes are graduates of the formal university system, where more theoretical knowledge is taught. Thus, the teachers lack the practical knowledge necessary for students in TVET. This scenario restricted students' ability to learn the skills that their future job needs from them. Thus, most students could not secure jobs after they graduated from TVET institutions. For example, in 2008, only 38% of students who graduated from TVET institutions in Punjab could find a job within one year after graduation, while 18% selected to continue further education.^[29] The employment rates declined from 62% in 2012 to 49% in 2015 and 38% in 2018. This scenario shows a severe concern for the future implementation of practical learning in TVET institutions.

In TVET institutes, teachers must be more capable of cultivating skilled and demand-driven individuals for social change and sustainable development. It is crucial

for the country to adjust its curriculum and TVET institutions according to the needs of the labor market to ensure that TVET education graduates meet market demands, are sufficiently competitive, and obtain the expected labor benefits. Another study based on a study of personnel in vocational training programs concluded that the TVET curriculum in Pakistan needs to have linkages with employers, which results in limited placements of graduates in the labor market.^[30]

CONCLUSION AND FUTURE RECOMMENDATIONS

The present research analyzed the historical developments of TVET, government initiatives to promote TVET, and significant challenges to TVET in Pakistan. The analysis showed that TVET in Pakistan witnessed a weak foundation since Pakistan's independence in 1947. Several policy documents were formulated, but the practical implementations of those policies did not show sufficient results. TVET in Pakistan is involved in training individuals with specific skills to find work in the industry. The number of institutions, enrollment, and teachers saw significant growth, especially at the beginning of the 21st century when new governing bodies were formed to promote the TVET and the importance of TVET was recognized in the national and provincial policy documents. Governments at national and provincial levels have started many initiatives to improve the quality of TVET and to apply TVET in real-life settings better.^[31] However, despite excellent growth and governments' interest in advancing TVET, it still faces many challenges.

To conclude, entrepreneurship education, gender equality, and inclusivity are the hallmarks of TVET in Pakistan. Entrepreneurship education equips students with the knowledge and skills required to manage businesses through entrepreneurship courses and seminars, fostering creativity and problem-solving abilities. Furthermore, TVET in Pakistan encourages the participation of girls and women in TVET programs, implements gender-sensitive curricula, eliminates barriers hindering women's involvement in TVET, and

establishes a supportive and inclusive educational environment. In order to improve the TVET, the government should prioritize TVET in national policy documents and allocate more financial resources to TVET institutions to strengthen the infrastructure for students and teachers. In addition, the teaching quality must be improved, teacher training programs must be analyzed, and new practices must be added to teacher training programs. In addition to that, gender disparities should be eliminated, and more efforts should be started to train more women.

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Author contributions

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Ethical approval

Not applicable.

Conflict of interest

The authors declare no conflict of interest.

Data availability statement

No additional data.

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