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Inclusive TVET: Strategies for Empowering Persons with Disabilities (PWDs) in Building Technology Skills

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Abstract: This study examined inclusive Technical and Vocational Education and Training (TVET) as a strategy for empowering Persons with Disabilities (PWDs) by enhancing their access to skills development, employability, and social participation. Basically, the study explored the significance of inclusive TVET, identified effective strategies for participation, and determined challenges hindering implementation. A descriptive survey design was adopted, focusing on stakeholders at the Federal College of Education (Technical), Asaba, Delta State. The sample comprised 10 instructors and 30 learners with various disabilities selected through purposive and accidental sampling. Data were collected using a validated researcher-designed questionnaire with a reliability coefficient of 0.78. Findings revealed that inclusive TVET significantly supports PWDs in developing employable skills, improving self-confidence, promoting economic independence, enhancing social integration, and contributing to national development. However, results indicated that inclusive TVET does not automatically guarantee equal learning opportunities without deliberate accommodations. Key challenges included inadequate funding, shortage of trained instructors, negative societal attitudes, poor infrastructure, limited assistive materials, and weak policy implementation, while lack of awareness was not found to be a major barrier to enrolment. Effective strategies identified to addressing the challenges included provision of assistive technologies, instructor training in inclusive pedagogy, government funding, flexible curriculum design, disability-friendly infrastructure, public awareness initiatives, and collaboration with advocacy groups. The study concludes that inclusive TVET is a vital pathway for empowering PWDs but requires sustained policy commitment, institutional reforms, stakeholder collaboration, and targeted resource allocation to achieve meaningful and equitable outcomes.

Key words: Education, empowerment, Persons with Disabilities (PWDs), skills development, Technical and Vocational Education and Training (TVET)

INTRODUCTION

Technical and Vocational Education and Training (TVET) plays a vital role in equipping individuals with practical skills, competencies, and knowledge required for employment, entrepreneurship, and lifelong learning. In recent years, global attention has increasingly focused on making TVET systems more inclusive, particularly for Persons with Disabilities (PWDs), who often face systemic barriers in accessing quality education and training opportunities (United Nations Educational, Scientific & Cultural Organization, [UNESCO], 2020). Inclusive TVET promotes equal participation by adapting learning environments, instructional methods, and assessment strategies to accommodate diverse learning needs and abilities.

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Despite international frameworks such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), many PWDs continue to experience marginalization in skills development programmes due to physical inaccessibility, societal stigma, inadequate policy implementation, and insufficient teacher preparation (United Nations, 2018). Inclusive TVET is not only a social justice issue but also an economic necessity, as empowering PWDs with vocational skills enhances their employability, independence, and contribution to national development (International Labour Organization, [ILO] 2019).

Effective strategies for inclusive TVET involve curriculum adaptation, assistive technologies, flexible teaching approaches, partnerships with industries, and targeted policy support. When institutions adopt inclusive practices, they create equitable learning opportunities that recognize the potential of all learners, thereby fostering social integration and sustainable development (Organization for Economic, Co-operation & Development [OECD], 2021). Therefore, strengthening inclusive TVET systems is essential for empowering PWDs and ensuring that no one is left behind in workforce development initiatives.

Empirical evidence indicates that persons with disabilities (PWDs) continue to face multiple, intersecting obstacles in Technical and Vocational Education and Training (TVET). These challenges range from inaccessible infrastructure and discriminatory admission practices to limited availability of specialized support services, all of which restrict equitable participation (Murgor et al., 2024). Beyond physical barriers, rigid instructional approaches and inadequately trained educators further constrain learning opportunities for PWDs, reducing their ability to fully benefit from vocational programs (Safidin & Nordin, 2025). Many PWD learners also report difficulties adjusting to institutional environments and engaging in hands-on training when reasonable accommodations are absent, which may negatively affect their confidence, skill acquisition, and completion rates. Collectively, these findings underscore the urgent need for systemic interventions that address both environmental and pedagogical constraints.

Qualitative studies across African contexts reveal that PWDs experience not only structural exclusion but also subtle forms of social marginalization within TVET institutions. Research from South Africa, for instance, shows that students with physical and cognitive disabilities often struggle to access instructional materials and navigate campus facilities, yet they demonstrate resilience by drawing on community support networks and cultural strengths (Muzite & Gasa, 2024). These lived experiences highlight that inclusion must extend beyond policy compliance to cultivating a supportive institutional culture that values diversity, encourages peer acceptance, and promotes equal participation. Addressing social attitudes and institutional norms is therefore as critical as improving physical accessibility.

Creating inclusive TVET systems begins with ensuring accessible infrastructure. Upgrading facilities with ramps, accessible workshops, adaptive equipment, and disability-friendly learning spaces can significantly reduce participation barriers (Safidin & Nordin, 2025). It is bases on this the UNESCO (2o21) developed a universal principle which emphasized that, educational environments should be designed to be inherently accessible and inclusive, incorporating features like ramps, adaptive equipment, and intuitive layouts to ensure all learners, regardless of physical, sensory, or mobility abilities, can safely and comfortably participate and benefit from learning. This approach promotes equitable use, flexibility, perceptible information, and independence for every student. Applying universal design principles ensures that facilities accommodate a wide range of mobility and sensory needs, thereby promoting independence, safety, and equal engagement for all learners. Such structural modifications also signal institutional commitment to equity and inclusion.

Inclusive education requires flexible curricula and teaching methods that recognize learner diversity. Adapting instructional materials, assessment strategies, and classroom interactions to different learning styles enhances participation and knowledge retention. Evidence from TVET institutions demonstrates that collaborative learning and differentiated instruction foster greater engagement among adult learners with disabilities (Study on inclusive teaching practices, 2025). Integrating experiential learning opportunities and alternative assessment formats can further strengthen skill acquisition while reducing achievement gaps.

Teachers are central to successful inclusion. However, inadequate preparation often limits their ability to address diverse learner needs effectively (Mabeza & Villacruz, 2025). Continuous professional development programs focusing on disability awareness, inclusive instructional strategies, and assistive

technology use can equip educators with the competencies required to create supportive learning environments. Strengthening teacher capacity not only improves instructional quality but also fosters positive attitudes toward inclusion.

Assistive technologies have emerged as powerful tools for enhancing access and participation in TVET. Devices and software that support communication, mobility, and personalized learning enable PWDs to overcome barriers and perform practical tasks more effectively. Such facilities include but not limited to: Screen readers, Braille displays, Magnification software, and Audio books / text-to-speech tools for the visually challenged; Hearing aids, FM/DM systems , Captioning software, Visual alert systems, for the Hearing Impaired, Alternative keyboards, Adaptive mice / trackballs, Speech recognition software, and Switch devices for the physically and motor learning disabilities; Mind-mapping tools, Reading and writing support tools, Focus and organization apps, Evernote, and Math support software, for those with cognitive learning disabilities, and Augmentative and alternative communication (AAC) devices such as Communication boards, and Text-to-speech apps for those with communication learning disabilities. When integrated with appropriate learning supports, these technologies can boost learner autonomy, engagement, and overall performance while narrowing participation gaps.

Achieving meaningful inclusion requires coordinated action among policymakers, educational institutions, employers, and civil society organizations. Policies should explicitly mandate inclusive practices in TVET and allocate sufficient funding for implementation. Importantly, involving PWDs in decision-making processes ensures that programs reflect real needs and local contexts. Collaborative partnerships can also promote smoother transitions from training to employment, thereby enhancing long-term empowerment and social integration. It on this background that this study examined inclusive Technical and Vocational Education and Training (TVET) as a strategy for empowering Persons with Disabilities (PWDs) by enhancing their access to skills development, employability, and social participation in building technology education.

Research Questions

RQ1: What is the impact of inclusive TVET in empowering Persons with Disabilities?

RQ2: What strategies can enhance the participation of Persons with Disabilities in TVET programmes?

RQ3: What challenges hinder the effective implementation of inclusive TVET for Persons with Disabilities?

METHOD

This study adopted a descriptive survey design to gather systematic data on stakeholders' views and experiences regarding inclusive Technical and Vocational Education and Training (TVET) for Persons with Disabilities (PWDs). The design was suitable because it enabled the researcher to describe existing practices, identify key issues, and examine relationships among variables without manipulation. It also provided a structured basis for exploring the concept, strategies, benefits, and challenges of inclusive TVET, generating evidence useful for policy and institutional improvement. The study was conducted in Federal College of Education (Technical), Asaba, Delta State. The institution was chosen for their experience in serving learners with diverse needs, including PWDs such as hearing, speech, and physical impairments. The population comprised 33 academic staff and 55 students in the School of Secondary Education (Technical), Asaba which include TVET instructors, special education teachers, and students with disabilities, as these groups are directly involved in programme planning, delivery, and participation. A sample of ten (10) teachers and 30 learners (with varied level of disabilities such as hearing, sight, speech, and other physical disabilities) was selected from the school of Technical and Vocational Education of the College as respondents. Due to the manageable size of the population, the convenience sampling techniques was used for the selection of the sample. With this technique, the respondents were approached and requested to participate in the study. Those who accepted to participate were selected while those who rejected were excluded. In this way, the 10 instructors and the 30 learners were selected.

Data were collected using a researcher-designed questionnaire titled Inclusive TVET for Persons with Disabilities Questionnaire (ITVETPWDQ). The instrument had four sections:

demographics, the concept and importance of inclusive TVET, strategies for effective inclusion, and implementation challenges. A four-point Likert scale (Strongly Agree to Strongly Disagree) was used to ensure clear responses and limit neutrality bias. Experts in TVET, and educational measurement validated the instrument for clarity and relevance, while a pilot study using Cronbach's Alpha yielded a reliability coefficient of 0.78 confirming internal consistency. 40 copies of the instrument were administered to the respondents with the help of two guided research assistants. All the copies were retrieved and used for data analysis. To ensure objectivity, a benchmark of 2.50 was decided. This was achieved by adding the values of the options of the instrument and dividing it by 4 which is the number of the options. An average score of 2.50 was attained and same was considered the benchmark for determination of a mean value as agreed or disagreed with.

RESULTS

The impact of inclusive TVET in empowering Persons with Disabilities

Table 1: Frequency Distribution, Mean score and Standard Deviation Distribution of Responses on the Impact of Inclusive TVET in Empowering Persons with Disabilities

S/N	Item	SA	A	D	SD	X	SD	Decision
1	Inclusive TVET programmes help Persons with Disabilities develop employable vocational skills.	11	8	6	5	2.83	1.12	Agree
2	Participation in inclusive TVET increases the self-confidence of Persons with Disabilities.	9	10	8	3	2.83	0.99	Agree
3	Inclusive TVET promotes economic independence among Persons with Disabilities.	7	12	4	7	2.63	1.10	Agree
4	Inclusive TVET enhances social inclusion and reduces discrimination against Persons with Disabilities.	8	6	9	7	2.50	1.14	Agree
5	Inclusive TVET improves the quality of life of Persons with Disabilities.	12	5	4	9	2.67	1.30	Agree
6	Inclusive TVET provides equal learning opportunities for Persons with Disabilities alongside others.	4	6	3	17	1.90	1.16	Disagree
7	Inclusive TVET helps Persons with Disabilities to contribute meaningfully to national development.	13	8	5	4	3.00	1.08	Agree
	Grand Mean/Standard Deviation					**2.62**	**1.12**	Agree

Results in table 1 revealed that respondents agreed with all the items except item 6 with a mean score of 1.90; a value that is significantly less than the 2.50 benchmark for determination of a mean score as agreed or disagreed. The mean cores for the other items ranged between 2.50 and 3.00; values that are significantly higher than the 2.50 benchmark. The grand mean and grand standard deviation for the result was 2.62 and 1.12 respectively. The results revealed that inclusive TVET programmes can help Persons with Disabilities develop employable vocational skills, increases the self-confidence of Persons with Disabilities, promotes economic independence among Persons with Disabilities, enhances social inclusion, reduces discrimination against Persons with Disabilities, improves the quality of life of Persons with Disabilities, and helps Persons with Disabilities to contribute meaningfully to national development. However, it also revealed that Inclusive TVET does not in itself provide equal learning opportunities for Persons with Disabilities alongside others.

Strategies that can enhance the participation of Persons with Disabilities in TVET programmes

Table 1: Frequency Count, Mean score and Standard Deviation Distribution of Responses on the Strategies to Enhance the Participation of Persons with Disabilities in TVET programmes

S/N	Item	SA	A	D	SD	x	SD	Decision
8	Provision of assistive technologies can increase participation of Persons with Disabilities in TVET programmes.	13	6	5	6	2.87	1.20	Agree
9	Training instructors on inclusive teaching methods can improve participation of Persons with Disabilities.	9	9	5	7	2.67	1.15	Agree
10	Government funding and scholarships can encourage Persons with Disabilities to enroll in TVET programmes.	12	7	7	4	2.90	1.09	Agree
11	Public awareness campaigns can promote acceptance of Persons with Disabilities in TVET institutions.	7	9	7	7	2.53	1.11	Agree
12	Flexible curriculum design can enhance learning for Persons with Disabilities in TVET programmes.	8	6	9	7	2.50	1.14	Agree
13	Creating disability-friendly infrastructure can improve participation in TVET programmes.	14	5	4	7	2.87	1.25	Agree
14	Collaboration with disability advocacy groups can strengthen participation in TVET initiatives	11	8	6	5	2.83	1.12	Agree
	Grand Mean/Standard Deviation					**2.73**	**1.15**	Agree

Result in Table 2 revealed that respondents agreed with all the items as the mean scores for the items range between 2.50 and 2.90; values that are significantly higher than 2.50 benchmark for determination of mean score as agreed or disagreed. The grand mean and standard deviation were 2.73 and 1.15 respectively. The results revealed that provision of assistive technologies can increase participation of Persons with Disabilities in TVET programmes just as training instructors on inclusive teaching methods government funding and scholarships, public awareness campaigns, flexible curriculum design, creating disability-friendly infrastructure, and collaboration with disability advocacy groups can strengthen participation in TVET initiatives.

Challenges hindering the effective implementation of inclusive TVET for Persons with Disabilities

Table 1: Frequency Count, Mean score and Standard Deviation Distribution of Responses on the Challenges Hinder the Effective Implementation of Inclusive TVET for Persons with Disabilities

S/N	Item	SA	A	D	SD	X	SD	Decision
15	Inadequate funding limits the implementation of inclusive TVET programmes.	9	9	10	2	2.83	0.95	Agree
16	Lack of trained instructors affects the quality of inclusive TVET delivery.	12	6	4	8	2.73	1.26	Agree
17	Negative societal attitudes discourage Persons with Disabilities from enrolling in TVET programmes.	8	10	7	5	2.70	1.06	Agree
18	Poor infrastructure makes TVET centres inaccessible to Persons with Disabilities.	6	12	5	7	2.57	1.07	Agree
19	Limited availability of assistive learning materials hinders effective participation	10	11	4	5	2.87	1.07	Agree

20	Weak government policies affect the promotion of inclusive TVET programmes.	9	9	7	5	2.73	1.08	Agree
21	Lack of awareness about inclusive TVET opportunities reduces enrolment of Persons with Disabilities	5	7	3	15	2.07	1.20	Disagree
	Grand Mean/Standard Deviation					**2.64**	**1.09**	Agree

Results in Table 3 revealed that respondents agreed with all the items except item 21 with a mean score of 2.07, a value that is significantly less than 2.50 benchmark. The mean scores for all the other items ranged between 2.57 and 2.87, and were significantly higher than the 2.50 benchmark. The grand mean and standard deviation were 2.64 and 1.09 respectively. The result revealed that Inadequate funding, shortage of trained instructors, negative societal attitudes towards Persons with Disabilities, poor infrastructure provision, limited availability of assistive learning materials, and weak government policies affect the promotion of inclusive TVET programmes. However, the results revealed that lack of awareness about inclusive TVET opportunities is not a factor reducing enrolment of Persons with Disabilities in TVET programmes.

DISCUSSION

Findings from the study revealed that inclusive TVET programmes can be of great help to Persons with Disabilities develop employable vocational skills, increases their self-confidence, promote economic independence, enhance social inclusion, reduce discrimination against Persons with Disabilities, improve the quality of life of Persons with Disabilities, and help Persons with Disabilities to contribute meaningfully to national development. These findings aligned with the position of the UNESCO, (2020) which stated emphatically that Inclusive TVET promotes equal participation by adapting learning environments, instructional methods, and assessment strategies to accommodate diverse learning needs and abilities. Findings also revealed that Inclusive TVET does not in itself provide equal learning opportunities for Persons with Disabilities alongside others as they could face other challenges while trying to participate in such programmes. This negated the position of Safidin and Nordin (2025) who stated that beyond physical barriers, rigid instructional approaches and inadequately trained educators further constrain learning opportunities for PWDs, there are other factors reducing their ability to fully benefit from vocational programmes .

Further findings from the study revealed that the provision of assistive technologies can increase participation of Persons with Disabilities in TVET programmes in addition to training instructors on inclusive teaching methods, government funding and scholarships, public awareness campaigns, flexible curriculum design, creating disability-friendly infrastructure, and collaboration with disability advocacy groups; efforts that can strengthen participation in TVET initiatives. These findings agrees with the findings of Muzite and Gasa, (2024) whose findings expressed concern on students with physical and cognitive disabilities often struggling to access instructional materials and navigate campus facilities, yet they demonstrate resilience by drawing on community support networks and cultural strengths.

Furthermore, results from the study revealed that inadequate funding, shortage of trained instructors, negative societal attitudes towards Persons with Disabilities, poor infrastructure provision, limited availability of assistive learning materials, and weak government policies affect the promotion of inclusive TVET programmes. These findings complemented the position of Mabeza and Villacruz (2025) who unequivocally stated that government insincerity in implementing policies on education and TVET specifically, hinders PWDs from participating in inclusive programmes denying PWDs opportunities to live and contribute meaningfully to society. However, the results further revealed that lack of awareness about inclusive TVET opportunities is not a factor reducing enrolment of Persons with Disabilities in TVET programmes as adequate jingles and campaigns on radio, television and other social media devices were and are still in place.

CONCLUSION

This research highlights inclusive Technical and Vocational Education and Training (TVET) as a powerful means of empowering Persons with Disabilities (PWDs) by improving their job prospects, independence, and participation in society. The results indicate that when TVET programmes are purposefully structured to address varied learning needs, PWDs acquire practical technical, entrepreneurial, and life skills that minimize reliance on others and encourage meaningful involvement in economic and community activities. Beyond promoting fairness, inclusive TVET also strengthens national productivity by harnessing the largely untapped abilities of PWDs. The study also shows that the effective involvement of PWDs in TVET largely relies on intentional measures such as modifying curricula, providing assistive devices, training instructors, implementing supportive policies, and fostering collaboration among stakeholders. When these approaches are applied, there is a notable increase in enrolment, retention, and completion rates among PWDs.

Despite these gains, the study points to ongoing obstacles that hinder the success of inclusive TVET. Key challenges include limited funding, inaccessible infrastructure, societal stigma, inadequate teacher training, and poor enforcement of policies. These issues continue to restrict many PWDs from obtaining quality vocational education, thereby slowing progress toward social equity and inclusive growth. In conclusion, although inclusive TVET offers significant opportunities for empowering PWDs, achieving its full potential requires continuous dedication, systemic improvements, and joint efforts from governments, institutions, communities, and development partners.

RECOMMENDATIONS

The following recommendations were made for the study:

1. The federal government in collaboration with the management of technical education institutions, should establish and rigorously implement policies that guarantee inclusivity in TVET institutions. Such policies must define accessibility requirements, allocate sufficient funding, and include accountability measures to prevent the exclusion of PWDs from vocational education.
2. TVET institutions need to provide accessible infrastructure, including ramps, modified workshops, adaptive equipment, and assistive technologies, to create an enabling environment for effective learning and participation by PWDs.
3. Ongoing training programmes should be organized by institutional management in collaboration with school deans, head of departments and technology professionals, for instructors to develop their competence in inclusive teaching practices, classroom management, and strategies for addressing diverse learner needs.
4. TVET curricula should be revised by the Ministry of education to suit different disability conditions while maintaining quality standards. Emphasis should be placed on flexible teaching methods, individualized instruction, and competency-based evaluation.
5. Government orientation agencies at both federal and state levels and institution authorities should engage in regular sensitization campaigns as parts of efforts to reduce stigma and transform public attitudes toward PWDs. Positive societal perceptions can lead to stronger community support and higher participation rates in TVET programmes.
6. Collaboration among government bodies, NGOs, private employers, and disability advocacy groups should be reinforced to provide financial support, internship placements, mentorship, and employment opportunities for PWDs.

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