

How do gender dynamics influence the preferences and decisions of an individual in selecting a technical and vocational education and training (TVET) program in Bhutan?

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***Original Research Papers** are papers that report on original empirical research with a focus on teaching and learning. Papers may be qualitative or quantitative and include an Abstract, Introduction, Method, Results, Discussion, and Reference section, as well as any tables and/or figures.

Abstract

This research explores various factors that influence the preferences and decisions of women when selecting specific Technical and Vocational Education and Training (TVET) programs, focusing on individual interests, career prospects and employment opportunities, work environment, family and community influence, representation and visibility, and access to information. The study draws on survey data collected from female trainees enrolled in public TVET institutions in Bhutan. The findings provide insights into the multifaceted elements that shape the choices of female trainees, offering valuable information to support efforts aimed at increasing female participation in TVET programs and enhancing their integration into the labour market. By examining these factors, the research contributes to the broader understanding of how to strengthen Bhutan's initiatives to empower women through TVET and workforce inclusion.

Introduction

The issue of gender disparity in Technical and Vocational Education and Training (TVET) remains a global challenge, and Bhutan is no exception. This disparity is evident in the lower enrollment rates of women in TVET programs, particularly in traditionally male-dominated fields (ILO, 2023). This lack of participation is particularly prominent in technical and industrial fields like construction, mechanics, and electronics, which are often perceived as male-dominated and offer better pay (ADB, 2020). Despite significant progress in educational equity, female enrollment in public TVET institutes in Bhutan has consistently lagged behind male enrollment, reflecting a need for concerted interventions to promote women's enrollment in TVET fields. From 2008 to 2023, the percentage of female students in public TVET institutes has shown some fluctuations, with an overall upward trend from 19.1% in 2008 to a high of 32.8% in 2022 (DWPSD, 2022) and 32.5% in 2023 (DWPSD, 2023). The increase can be attributed to consistent efforts made over the years in terms of increasing access to vocational training, improving the quality and relevance of vocational training, and targeted interventions for disadvantaged groups, including female participation in TVET over the years (RGoB, 2024).

Quite recently, a National TVET Gender Strategy for 2024-2028 was developed with the objectives to: increase female enrollment in formal TVET institutions; promote a positive perception and attitude towards women in training and employment; and enhance gender-responsive infrastructure, facilities, and environments to provide appropriate support at all stages of vocational education and training (DWPSD, 2024). One of the key targets includes increasing female participation in TVET programs to 45% by 2028, which has been streamlined into the 13th FYP target (RGoB, 2024), thus highlighting the importance of female enrollment in public TVET institutions.

The selection of TVET courses is a critical decision for individuals, shaping their future career trajectories and socio-economic opportunities. The decision is especially important considering the rapid changes occurring in the labour market due to technological advancements and globalization. Individuals entering the workforce today face a future marked by transformative change, making the selection of a TVET course even more critical. It is essential to equip oneself with the skills and knowledge to adapt to these changes for long-term career success and economic security (ILO, 2019). However, this decision is not made in isolation as it is influenced by various factors such as personal interests, societal gender roles, career aspirations and employment prospects (Dumadag, Rosales, & Requino, 2024). Despite equal access to TVET courses for both genders, female students often demonstrate a tendency to select certain courses over others. As a result, there is a significant variation in female enrollment across different TVET fields.

Female enrollment in the ten institutes was reported at 32.5% in 2023 (DWPSD, 2023) and 28% in May 2024 as per the enrollment data on TVET-MIS. The May 2024 TVET-MIS data shows that TVET courses such as weaving, embroidery, tailoring, hair and beauty, and baking had more than 70% female enrollment. On the other hand, courses such as metal art and fabrication, industry electrical technician, mason, auto electrician, contemporary sculptor, refrigeration and air conditioning, solar power technology, mechanical fitter, CNC machinist, construction carpentry, mobile robotic, traditional metal art, welding, traditional painting, furniture making, tile laying, auto mechanic, automobile painting, backhoe operator, basic landscape design, earthmoving equipment mechanic, excavator operator, heavy auto mechanic, heavy vehicle driving, traditional sculpture, panel beater,

traditional wood carving, wood turning, and transmission and distribution linesman had less than 30% female enrollment. Correspondingly, the proportion of the female workforce in major economic activities such as mining and quarrying; electricity, gas, steam and air conditioning supply; construction; transportation and storage; information and communication; and professional, administrative and support service activities; and public administration and defence and compulsory social security is less than 30% (NSB, 2023).

This research aims to examine the factors influencing the preferences and decisions of a female individual when selecting specific TVET programs. These factors are categorized into six areas: interest of the individual; career prospects and employment opportunities; nature of work/ work environment; community/family influence and expectation; representation and visibility; and access to information.

The objectives of this research are to: examine the factors influencing the preferences of female individuals in selecting TVET programs; investigate how societal gender roles and expectations impact decision-making processes in selecting TVET programs; and provide a broader understanding of how to strengthen Bhutan's initiatives to empower women through TVET.

Research Methodology

The central research question for this study is: *How do gender dynamics influence individual preferences and decision-making in selecting a Technical and Vocational Education and Training (TVET) program in Bhutan?* This question seeks to understand how societal expectations, perceptions of gender roles, and individual motivations impact the TVET and career choices of students within the TVET system. Various barriers such as lack of access to information, gender stereotypes, and training and labour market constraints faced by women often lead to them having low-paying, low-skill jobs (ADB, 2020). By focusing on these influences, the study aims to uncover the specific ways in which gender norms shape students' decisions, thereby informing more equitable policies and practices within TVET institutions.

The findings for this research are primarily the data collected through a structured survey distributed to female trainees currently enrolled in different TVET programs in the ten public institutions under the Department in September 2024.

This exclusive group was considered mainly because they have considered all the factors when making their choice and getting enrolled in current TVET courses, thus putting them in a better position to give meaningful insight into their motivations, perceptions of gendered expectations in specific fields, and experiences regarding societal influences on their program choices. Research has shown that targeted surveys often yield better findings by improving data relevance and accuracy (Menon & Muraleedharan, 2020). By focusing on female trainees, the study aims to better understand the challenges and considerations faced by female trainees in an educational space, particularly in fields where gender stereotypes may have resulted in over or under female representation.

The data collected through the survey has both quantitative and qualitative questions to provide a comprehensive understanding of the gender dynamics at play. Quantitative data from survey responses was examined through descriptive and inferential statistics, such as frequency analysis and cross-tabulations, to identify any significant associations between gender and program choice. In parallel, qualitative analysis was conducted on open-ended responses to identify recurring themes and patterns, especially around societal expectations and personal experiences with gender norms. The combination of quantitative and qualitative insights allows for a more nuanced exploration of how gender influences program selection within TVET.

Data security and confidentiality were prioritized throughout the study to ensure ethical rigour. All participants were informed about the study's purpose and data handling practices before participating, and their consent was formally obtained. The survey was conducted online, giving space and freedom to participants, thus reducing the risk of interviewer bias and ensuring that participants answer questions independently without the external influence or pressure of a human interviewer, which can help improve the accuracy and reliability (Kapiche, 2022). Collected data was securely stored, and participants' identities were anonymized to protect their privacy. Strict confidentiality protocols were upheld, ensuring that no personally identifiable information could be linked back to participants. These measures were put in place to foster a respectful and safe research environment, allowing participants to share their perspectives openly and without concern for personal disclosure.

The survey was conducted in September and October 2024. The target groups were specifically the 412 females enrolled in the public TVET system as of September 2024. With 395 participants out of a population of 412, the sample proportion is 0.958, which accounts for approximately 95.8% of the population participating in the survey. The margin of error (MOE) for the survey is approximately 0.0196, or 1.96%. This means we can be 95% confident that the true participation rate of the population lies within $\pm 1.96\%$ of the observed sample proportion (95.8%). Given that nearly the entire population (95.8%) was sampled, the findings from this survey can be considered highly representative of the entire population of 412 individuals. The large sample size relative to the population means that any patterns or trends observed in the data are likely reflective of the actual population, and thus, the statistical significance is very strong. The proportion of survey participants in TVET courses in accredited courses is 69.1%.

Among the ten institutes in the public TVET system, only four—offering traditional arts and crafts, agriculture, and tourism and hospitality courses—report female enrollment exceeding 40% (DWPSD, 2023). Among the surveyed female trainees, 53.4% were enrolled in traditionally male-dominated courses such as Auto Electrician, Auto Mechanic, Barista, Biomedical Equipment Technician, CNC Machinist, Cloud Computing, Computer Hardware and Networking Technician, Construction Carpentry, Domestic Electrician, Electrician, Food Product Development, Industrial Wiring, Industry Electrical Technician, Mason, Mechanical Fitter, Metal Art and Fabrication Technician, Mobile Robotics, Traditional Painting, Plumbing, Refrigeration and Air Conditioning Technician, Transmission and Distribution Lineman, Traditional Metal Art, Upholstery, Welder, and Wooden Furniture Making. In contrast, the remaining trainees were enrolled in traditionally female-dominated courses such as Basic Floriculture, Early Childhood Care and Development Facilitation, Embroidery, Sowa Rigpa and Wellness, Hair and Beauty, Applique, and Tailoring.

Research Findings

a. A higher degree of information is key to female participation in TVET.

Access to information plays a pivotal role in increasing female participation in TVET courses. The survey provides insights into whether participants had prior knowledge about TVET before enrolling in their current courses (see [Tables 1](#) and

2). Results indicated that 91.9% of respondents obtained information through digital mediums such as social media, websites, and other internet-based sources, highlighting the significant impact of these platforms. Friends and family also emerged as influential, with 82.2% reporting that these networks provided information about vocational training opportunities. Conversely, traditional communication channels, including print newspapers, television, and radio, were the least effective sources of information, capturing the lowest proportion of respondents.

Notably, 98.9% of the female trainees enrolled in the TVET system reported having prior knowledge about the field, which indicates a higher proportion of those with information taking up TVET courses. Female participation in male-dominated TVET fields can be significantly influenced by increasing access to relevant information as it improves awareness, reduces stereotypes, and provides resources for career possibilities (Bray-Collins, Andrade, & Wanjiru, 2022). Furthermore, 78.2% of respondents rated their prior knowledge of vocational programs in Bhutan as either good or average, and 83.3% reported similar levels of prior knowledge about institutes offering vocational

training in Bhutan. These findings underscore the need to enhance access to information to broaden career clarity for females in traditionally male-dominated spaces (Bray-Collins, Andrade, & Wanjiru, 2022). While females may be motivated to join male-dominated fields due to personal ambition, career prospects, and a desire to challenge gender stereotypes, enrollment in such courses can be hampered by a lack of information about TVET programs and policies (Uwiringiyimana, 2022).

b. Family and community support can be critical for female participation in TVET.

Support from parents or guardians significantly influences female participation in vocational training. Often influenced by cultural norms, parents discourage women from pursuing TVET programs that are perceived as male-dominated, shaping the career choices of many women (Alinea, 2022). The survey revealed that 86.8% of female trainees came from families where parents or guardians were supportive of women pursuing vocational trades. Additionally, 57.7% of trainees reported that their communities held TVET in high regard. A strong correlation was observed between parents'

Table 1. Information about TVET—summary of observations with proportions, standard errors, and confidence intervals

| Variable | Label | Obs (N=412) | Proportion (who answered yes) | Std. err. | Binomial exact [95% conf. interval] |
|----------|--|-------------|-------------------------------|-----------|-------------------------------------|
| b1_1 | I had adequate information about vocational training opportunities in Bhutan from my school | 395 | 0.6632911 | 0.0237783 | 0.614329 - 0.7097845 |
| b1_2 | My friends/family provided me with information about vocational training | 395 | 0.8227848 | 0.019213 | 0.7814833 - 0.8591675 |
| b1_3 | I was able to get information about vocational training in Bhutan from newspaper, television and radio | 395 | 0.5316456 | 0.0251073 | 0.481091 - 0.5817226 |
| b1_4 | I was able to get information about vocational training in Bhutan from social media pages, websites, and other sources on the internet | 395 | 0.9189873 | 0.0137288 | 0.8875579 - 0.9439291 |
| b1_5 | I was able to get information about vocational training from the institute and government advocacy programs | 395 | 0.6911392 | 0.0232469 | 0.6430001 - 0.7363863 |

Table 2. Level of knowledge about vocational programs before enrollment

| Variable | Label | Poor Knowledge | Average Knowledge | Good Knowledge |
|----------|--|----------------|-------------------|----------------|
| b2_1 | Before enrollment in the current institute, what was your level of knowledge about vocational programs in Bhutan? | 0.2177 | 0.6684 | 0.1139 |
| b2_2 | Before enrollment in the current institute, what was your level of knowledge about the institutes in Bhutan providing different vocational training? | 0.1671 | 0.6532 | 0.1797 |

or guardians' positive reactions to female enrollment in TVET programs (see [Table 3](#)). Parents and guardians demonstrated a higher likelihood of being supportive when they were more accepting of females in vocational trades or when their communities valued vocational training.

Over the years, there has been a gradual acknowledgement of the value of TVET due to increased awareness of its role in equipping students with practical, employable skills and adapting to labour market demands. This shift has led to more community support, although challenges like outdated perceptions of TVET as less prestigious than academic paths still exist. Research suggests that community and family influence can be critical in empowering women to achieve professional success, emphasizing the significance of cultural support in promoting equity and inclusion (Moridnejad et al., 2024). Programs aimed at improving infrastructure and aligning training with industry needs have contributed to enhancing its perception among families and communities (Yeap et al., 2021). Family encouragement also plays a critical role in retention, as supportive families enable female students to persist despite challenges, particularly in male-dominated technical fields (Mutiku & Kiaritha, 2022). When sensitization campaigns are directed to family members, it can also lead to increased enrollment of women in male-dominated courses (Clerici et al., 2024).

c. Intrinsic factors are more important than extrinsic factors when it comes to a higher degree of satisfaction with the choice of TVET courses.

While family or guardian support during the initial phase is crucial, intrinsic factors such as trainees' personal aspirations and their evaluation of the course in terms of earning potential and employment opportunities proved to be more influential in determining their satisfaction with their choice. Female trainees who enrolled in the program due to personal aspirations overwhelmingly indicated that they would choose

the same course again (see [Table 4](#)). Intrinsic motivation, including personal aspirations and the perceived benefits of courses, significantly enhances student engagement and satisfaction. Students are more likely to continue their education and be satisfied with their choices if they pursue courses based on personal interest and the perceived relevance of the courses (Yan et al., 2024). Lee et al. (2021) highlight the importance of intrinsic motivations in increasing levels of satisfaction and influencing individuals' career and job decision-making processes.

Individuals are also more likely to choose TVET courses that align with their career interests, emphasizing the importance of matching career aspirations with the labour market to ensure student satisfaction and career success (Bakar and Mahmud, 2020). Positive outcomes were observed among those who assessed the program favourably based on its potential for career and financial growth. TVET programs traditionally viewed as male-dominated and less accessible to women due to social and cultural norms can attract more female participants by highlighting clear financial benefits and opportunities for career advancement (UNESCO, 2022).

d. Representation and visibility matter complemented by female-friendly facilities and curriculum.

Representation and visibility of women in TVET are essential for challenging gender stereotypes and fostering inclusivity in traditionally male-dominated fields. Female role models in non-traditional career paths create an inclusive environment, inspiring young women with confidence and demonstrating that these careers are accessible to them (Ramadan et al., 2024). Increased female participation also promotes workforce diversity, introducing broader perspectives and fostering innovation in various industries. Visibility not only challenges societal norms but also builds a supportive environment that encourages more women to consider TVET as a viable and rewarding option.

Table 3. Chi-Square Tests for independence between parent/guardian’s reaction when enrolled in the TVET program and their/community’s view

What was your parent/guardian’s reaction when you enrolled in the program?

| What do you think is your parent/guardian's view of females in vocational programs? | parent/guardian's reaction when you enrolled in the program They were supportive | parent/guardian's reaction when you enrolled in the program They were not supportive |
|--|---|---|
| They are supportive of females in vocational trades (86.84 %) | 338 (98.54%) | 5 (1.46%) |
| They think females should not take up vocational programs (6.33%) | 24 (96.00%) | 1 (4.00%) |
| They are indifferent (6.84%) | 23 (85.19%) | 4 (14.81%) |

Pearson $\chi^2(2) = 18.3305$ Pr = 0.000

| Would you say the TVET course you choose is highly regarded in your community? | parent/guardian's reaction when you enrolled in the program They were supportive | parent/guardian's reaction when you enrolled in the program They were not supportive |
|---|---|---|
| Yes (57.72%) | 226 (99.12%) | 2 (0.88%) |
| No and I'm not sure (42.28%) | 159 (95.21%) | 8 (4.79%) |

Pearson $\chi^2(1) = 5.9822$ Pr = 0.014

When choosing their current TVET programs, 84.3% of female trainees reported having seen other women working in related fields or occupations. Additionally, 90.9% agreed that the courses they enrolled in were female-friendly. High proportions of respondents indicated satisfaction with institutional accommodations, including adequate toilet and bathroom facilities, sufficient female trainers, and tools, equipment, and machines designed with female trainees in mind (see [Table 5](#)). Correspondingly, 97.5% agree that having adequate accommodation for female trainees will encourage female trainees into vocational training, and 97% agree that having adequate female trainers will encourage female trainees into vocational training.

Having female role models, including female TVET professionals, educators and leaders in TVET-related careers, is a powerful tool to counter the existing androcentric narrative, demonstrating that women can thrive and lead in these settings (Godji, 2021; Morgenroth et al., 2015). Such representation builds confidence and a sense of belonging among female students. Furthermore, ensuring adequate facilities and tools specifically designed for female users and incorporating gender considerations in curricula development (Koros & Achieng, 2023) can significantly enhance their

comfort and willingness to participate in technical training. Technical courses can seem less daunting and more accessible to female trainees with the presence of tailored tools that reduce physical strain and improve efficiency (Mutiku & Kiaritha, 2022).

e. TVET Scholarship is important for higher female enrollment.

When considering the factors influencing enrollment in TVET programs, 95.7% of participants identified the free provision of courses as a significant factor in their decision-making process. This factor was rated the highest among all others (see [Table 6](#)). The importance of this factor is further supported by the family backgrounds of the female trainees. According to the Labour Force Survey (LFS) 2023 Q3, 43.3% of the workforce is engaged in agricultural farming. However, a significant 74.2% of female trainees enrolled in the TVET program come from parents or guardians with farming backgrounds. A significant 65.6% said that their parents or guardians had no education, and 10% said they had primary-level education. The provision of TVET programs at no cost to trainees or their families plays a crucial role in facilitating participation for individuals from modest socio-economic backgrounds, making vocational education more

Table 4. Chi-Square Test for independence between factors influencing choice and satisfaction with choice of courses

| Variable | Label | (Agree) would choose the same course again | (Disagree) would choose the same course again | Chi-Square Test |
|----------|---|---|--|--------------------------------------|
| c1_1 | It has been my dream/personal aspiration to take up this course | 248 (81.58%) | 57 (62.64%) | Pearson chi2(1) = 14.2824 Pr = 0.000 |
| c1_2 | I researched and found that the course I'm choosing has good employment opportunities in Bhutan | 279 (81.34%) | 26 (50.00%) | Pearson chi2(1) = 25.2105 Pr = 0.000 |
| c1_3 | I researched and found that the course I'm choosing has good employment opportunities overseas | 259 (81.45%) | 46 (59.74%) | Pearson chi2(1) = 16.6014 Pr = 0.000 |
| c1_4 | The course I chose has high earning potential | 254 (82.47%) | 51 (58.62%) | Pearson chi2(1) = 21.9274 Pr = 0.000 |
| c1_5 | The course I chose is highly respected in my community/society | 244 (80.0%) | 61 (67.78%) | Pearson chi2(1) = 5.9006 Pr = 0.015 |
| c1_6 | The course I chose has opportunities for career advancement | 284 (81.14%) | 21 (46.67%) | Pearson chi2(1) = 26.9385 Pr = 0.000 |
| c1_7 | My family and guardians encouraged me to take up the course | 242 (79.34%) | 63 (70.00%) | Pearson chi2(1) = 3.4490 Pr = 0.063 |

Table 5. Female trainees' assessment of the facilities—summary of observations with proportions, standard errors, and confidence intervals

| Variable | Label | Obs (N=412) | Proportion (who answered yes) | Std. err. | Binomial exact [95% conf. interval] |
|----------|--|-------------|-------------------------------|-----------|-------------------------------------|
| f5_1 | Adequate accommodation for female trainees | 395 | 0.9468354 | 0.0112889 | 0.919878 - 0.9667927 |
| f5_2 | Adequate toilet and bathroom facilities for female trainees | 395 | 0.9367089 | 0.0122511 | 0.907985 - 0.9586261 |
| f5_3 | Adequate female trainers | 395 | 0.8759494 | 0.016586 | 0.8393324 - 0.9068004 |
| f5_4 | Female-friendly tools, equipment, machines and facilities during training in the institute | 395 | 0.9063291 | 0.0146604 | 0.8732006 - 0.9331879 |

accessible to those with limited financial resources, leading to higher enrollment and completion rates. Parental factors, including poverty, can discourage females from pursuing technical careers and also contribute to low enrollment rates (Nthuku & Muthima, 2023). Free TVET programs promote skill development while encouraging women to pursue a wider range of careers, contributing to economic growth and

advancing gender equity (Meath, 2021). One of the main recommendations from the female trainees to make TVET programs more female-friendly was to provide financial incentives or scholarships specifically for female students to encourage their enrollment in TVET programs.

f. Females are not averse to physical labour as assumed by many.

The “nature of work” emerges as a critical consideration for many female trainees when selecting a TVET program, with 72.4% indicating this as an important factor in their decision-making process (see Table 7). Among those who viewed this as a key factor, a significant proportion expressed a preference for a job that involves a combination of both desk and non-desk tasks. The preference for either exclusively desk-bound or exclusively non-desk roles is comparatively low, reflecting a desire for diverse and varied working conditions. Additionally, a high number of female trainees stated that it did not matter whether the job was desk-based or non-desk based. This openness to diverse work environments suggests a readiness to engage in physical labour when required. A study based on the Instructional Theory for Skills Development and using a descriptive survey

method concludes that young women are willing and able to train in skills in male-dominated TVET sectors (Kamonjo & Wamuga, 2022).

The survey findings also show that 91.4% of respondents did not mind working in occupations that required medium to high physical labour, with only 8.6% of respondents preferring jobs with low physical labour demands. This finding contradicts previous studies that suggest women are less likely to pursue TVET courses that lead to jobs requiring significant physical labour (OECD, 2023). However, the general perception of the respondents (49.4%) was that the physical labour associated with certain TVET occupations discouraged other women from enrolling in these courses. Yet, when it came to personal preference, most respondents did not mind pursuing such occupations. This could be a result of the ongoing mechanization and digitization of various industries; this

Table 6. Factors considered when choosing TVET that female trainees are enrolled in - summary of observations with proportions, standard errors, and confidence intervals

| Variable | Label | Obs (N=412) | Proportion (who agree) | Std. err. | Binomial exact [95% conf. interval] |
|----------|---|-------------|------------------------|-----------|-------------------------------------|
| c1_1 | It has been my dream/personal aspiration to take up this course | 395 | 0.7696203 | 0.0211866 | 0.7248913 - 0.8102561 |
| c1_2 | I researched and found that the course I'm choosing has good employment opportunities in Bhutan | 395 | 0.8683544 | 0.0170119 | 0.8309711 - 0.9000949 |
| c1_3 | I researched and found that the course I'm choosing has good employment opportunities overseas | 395 | 0.8050633 | 0.0199326 | 0.7625003 - 0.8429843 |
| c1_4 | The course I chose has high earning potential | 395 | 0.7797468 | 0.0208516 | 0.7355918 - 0.8196525 |
| c1_5 | The course I chose is highly respected in my community/society | 395 | 0.7721519 | 0.0211045 | 0.7275632 - 0.8126085 |
| c1_6 | The course I chose has opportunities for career advancement | 395 | 0.8860759 | 0.0159862 | 0.8505417 - 0.9156787 |
| c1_7 | My family and guardians encouraged me to take up the course | 395 | 0.7721519 | 0.0211045 | 0.7275632 - 0.8126085 |
| c1_8 | The course was provided for free | 395 | 0.956962 | 0.0102112 | 0.9319847 - 0.9747321 |
| c1_9 | I had no other choice | 395 | 0.2886076 | 0.0227987 | 0.2443875 - 0.3360283 |
| c1_10 | I've seen other women working in this field/occupation | 395 | 0.843038 | 0.018303 | 0.8033468 - 0.8774911 |
| c1_11 | Other women working in this field/ occupation inspired/encouraged me | 395 | 0.756962 | 0.0215812 | 0.7115625 - 0.7984633 |

adaptability could empower female workers in traditionally male-dominated sectors, enabling greater inclusion and participation.

In addition, curriculum transformation, which is part of NEP 2024, in terms of integrating digital technology into TVET curricula, including concepts like Artificial Intelligence (AI), Design Thinking, Robotics, Machine Learning, and more, can equip students with the digital literacy and skills necessary for a technologically advanced workplace (MoESD, 2024). Further, infrastructure upgrades, which are both parts of the 13th FYP and the NEP 2024, include plans of equipping institutes with state-of-the-art technology, such as modern laboratories and workshops, and ensuring nationwide connectivity with reliable, high-speed, and low-cost internet (MoESD, 2024). Furthermore, technological advancements can have potential benefits for women. The growth of the green and digital economies has the potential to create millions of decent jobs, with the circular economy and renewable energy sector alone projected to create a net total of 18 million new jobs by 2030. Digitalization can also

enhance productivity, income, and social well-being by offering more flexible working arrangements and reducing occupational hazards (ILO, 2023).

g. Females prefer jobs with a higher degree of occupational safety and safe working conditions.

While female trainees are generally not opposed to physical labour, workplace safety and safe working conditions are crucial considerations. A significant 86.8% of respondents indicated that a safe working environment was an important factor when selecting the course they are currently pursuing. The proportion of individuals who prioritize safe working conditions is notably high, even among those who did not initially consider this factor when making their decision (see [Table 7](#)). This underscores the importance of ensuring safety in the workplace, particularly for female trainees, regardless of their initial focus.

TVET courses linked to high-risk sectors have low female enrollment due to perceived dangers and less

Table 7: Independence between factors influencing the choice of program and factor categories with Chi-Square Test

Table 7a. Nature of work as a factor

| Did you consider 'Nature of work' as a factor when choosing the course you are currently enrolled in? | Desk job | Non-desk job | combination of both | It does not matter |
|---|-------------|--------------|---------------------|--------------------|
| Yes (72.41%) | 31 (10.84%) | 9 (2.80%) | 155 (54.2%) | 92 (32.17%) |
| No (27.59%) | 5 (4.59%) | 3 (2.75%) | 33 (30.28%) | 68 (62.39%) |

Pearson $\chi^2(3) = 30.6640$ Pr = 0.001

Table 7b. Type of work as a factor

| Did you consider 'Type of work' as a factor when choosing the course you are currently enrolled in? | High physical labour | Med physical labour | Low physical labour | It does not matter |
|---|----------------------|---------------------|---------------------|--------------------|
| Yes (71.39%) | 51 (18.09%) | 141 (50.00%) | 22 (7.80%) | 68 (24.11%) |
| No (28.61%) | 7 (6.19%) | 37 (32.74%) | 12 (10.62%) | 57 (50.44%) |

Pearson $\chi^2(3) = 31.5152$ Pr = 0.000

Table 7 continued on next page...

Table 7c. Risk factor as a factor

| Did you consider 'Risk Factor' as a factor when choosing the course you are currently enrolled in? | I do not mind working risky jobs | I prefer jobs that are not risky |
|--|----------------------------------|----------------------------------|
| Yes (62.28%) | 104 (42.28%) | 142 (57.72%) |
| No (37.72%) | 68 (45.64%) | 81 (54.365) |

Pearson chi2(1) = 0.4264 Pr = 0.514

Table 7d. Number of female in the workplace as a factor

| Did you consider 'Number of Female in the workplace' as a factor when choosing the course you are currently enrolled in? | I prefer to work in a firm with more female workers | I prefer to work in a firm with some female workers | It does not matter |
|--|---|---|--------------------|
| Yes (56.46%) | 82 (36.77%) | 71 (31.84%) | 70 (31.39) |
| No (43.54%) | 30 (17.44%) | 20 (11.63%) | 122 (70.93%) |

Pearson chi2(2) = 61.2448 Pr = 0.000

Table 7e. Safe work environment as a factor

| Did you consider 'Safe work environment' as a factor when choosing the course you are currently enrolled in? | I prefer jobs with safe working conditions | It does not matter |
|--|--|--------------------|
| Yes (86.84%) | 315 (91.84%) | 28 (8.16%) |
| No (13.16%) | 31 (59.62%) | 21 (40.38%) |

Pearson chi2(1) = 43.1430 Pr = 0.000

accommodating conditions. When respondents were asked why female enrollment was low in certain male-dominated TVET courses, risk factors ranked the highest at 57.2%. Respondents attributed this low enrollment to the risks associated with such occupations. Additionally, 56.5% of respondents expressed a preference for working in jobs that were not considered risky. A safe working environment is crucial for increasing women's participation and retention and improving job satisfaction (ILO, 2023). Additionally, workplaces free from harassment and discrimination can result in higher retention and lower employer costs. Such practices improve worker satisfaction and productivity, further enhancing wages and the economic security of working women (Salas-Betsch, 2024).

h. Females have a higher degree of satisfaction in male-dominated courses.

The proportion of females expressing a willingness to choose the same course again is significantly higher among those

enrolled in traditionally male-dominated fields (83.9%) compared to their counterparts in traditionally female-dominated courses (69.6%). This disparity suggests greater satisfaction or perceived utility among women pursuing male-dominated disciplines. Furthermore, a significant number of female trainees from female-dominated fields indicated a preference to shift to alternative areas such as domestic wiring, welding, electrical work, and ICT if given the opportunity. This inclination is primarily driven by the perception that these fields provide higher employment prospects both locally and internationally, as well as the potential for higher wages/earnings (see [Table 8](#)).

Women who choose traditionally male-dominated courses often do so for strong job prospects, higher income potential, and faster career progression. Women working technical jobs such as construction perceive these trades as being more lucrative compared to traditionally female-dominated fields (Ramadan et al., 2024). The desire for better pay and job

Table 8: Satisfaction and factors determining the choice of TVET course between females in male/female-dominated courses

Table 8a. Response to question, “Would choose the same course again”

| Male-dominated courses | (Agree) | (Disagree) |
|------------------------|--------------|-------------|
| Yes (53.42%) | 177 (83.89%) | 34 (16.11%) |
| No (46.58%) | 128 (69.57%) | 56 (30.43%) |

Pearson $\chi^2(1) = 11.4579$ Pr = 0.001

Table 8b. Response to question, “I researched and found that the course I’m choosing has good employment opportunities in Bhutan”

| Male-dominated courses | (Agree) | (Disagree) |
|------------------------|--------------|-------------|
| Yes (53.42%) | 189 (89.57%) | 22 (10.43%) |
| No (46.58%) | 154 (83.70%) | 30 (16.30%) |

Pearson $\chi^2(1) = 2.9705$ Pr = 0.085

Table 8c. Response to question, “I researched and found that the course I’m choosing has good employment opportunities overseas”

| Male-dominated courses | (Agree) | (Disagree) |
|------------------------|--------------|-------------|
| Yes (53.42%) | 189 (89.57%) | 22 (10.43%) |
| No (46.58%) | 129 (70.11%) | 55 (29.89%) |

Pearson $\chi^2(1) = 23.7289$ Pr = 0.000

Table 8d. Response to question, “The course I chose has high earning potential”

| Male-dominated courses | (Agree) | (Disagree) |
|------------------------|--------------|-------------|
| Yes (53.42%) | 182 (86.26%) | 29 (13.74%) |
| No (46.58%) | 126 (68.48%) | 58 (31.52%) |

Pearson $\chi^2(1) = 18.0874$ Pr = 0.000

security motivates many women to pursue careers in these fields, which have historically been seen as less accessible to women (Fitzgerald, 2021).

Discussion

Limitations And Further Research

The findings of this research paper are based solely on a TVET gender survey conducted with female trainees enrolled in ten public institutions under the direct administration of the Department of Workforce and Skills Development (DWPSD), Ministry of Education and Skills Development (MoESD), in September 2024.

Consequently, the research findings are limited by the exclusive nature of the survey’s target group. To expand on these findings, future research should consider conducting similar surveys among female trainees to observe how factors

influencing the choice of TVET courses evolve over time. Additionally, while this study focuses on female trainees who selected TVET programs, it would be valuable to include a comparative survey of female individuals who opted for non-TVET pathways. This could provide a more comprehensive understanding of their decision-making processes and offer insights into strategies to attract those who do not currently choose TVET programs.

Furthermore, targeted studies examining the post-training outcomes of female graduates could be beneficial, leveraging the TVET tracer studies conducted by the DWPSD to better understand gender-related outcomes in the labour market. A research focus on large and medium-scale employers in Bhutan could also provide deeper insights into employer perceptions, particularly regarding gender preferences or stereotypes and their role in promoting equal employment

opportunities. This is particularly important given the significant challenges women face when transitioning into the workforce due to persistent gender biases and limited job opportunities (Wignall et al., 2023).

Conclusion

While TVET courses in Bhutan demonstrate significant progress in fostering a female-friendly environment, the findings highlight persistent challenges that require critical attention. Positive perceptions among the majority of female trainees—centred on inclusivity, empowerment, and accessibility—are counterbalanced by concerns such as limited job opportunities, gender bias, and cultural stereotypes. These barriers not only hinder the effectiveness of TVET in achieving gender equity but also risk reinforcing systemic inequities if left unaddressed. Reducing gender disparities in education and labour force participation can enhance the available human capital for production and management, leading to increased productivity and higher income (Dieppe, 2021). Gender gaps in training and employment can be bridged by improving female enrollment and participation in traditionally male-dominated TVET courses, contributing to productivity and economic growth in developing economies (Dieppe et al., 2020). To bridge this gap, deliberate measures such as increasing female representation, addressing discriminatory practices, and tailoring support mechanisms are essential. By critically examining and addressing these shortcomings, TVET has the potential to serve as a transformative force for gender equality in Bhutan's workforce.

The findings in this research emphasize that fostering greater female participation and satisfaction in TVET courses requires a multifaceted approach. Increasing access to comprehensive information about TVET opportunities is pivotal, as informed decision-making encourages enrollment. Additionally, family and community support play a critical role in enabling women to pursue these programs. While intrinsic motivations such as personal interest and self-empowerment are primary drivers of satisfaction, external factors such as representation, female-friendly facilities, and targeted scholarships significantly impact enrollment and retention. Contrary to common assumptions, many women have a higher degree of satisfaction in male-dominated fields and are not averse to physical labour but prioritize safe working conditions and occupational security. Addressing these factors holistically can help create an environment

where TVET becomes a more viable and empowering pathway for women, contributing to greater gender equality in the workforce.

Female representation and visibility can best be achieved by supporting the realization of women's aspirations within the current TVET system. Providing equitable access to high-quality, industry-aligned training that equips women with competitive skills is crucial, and this must be complemented by gender-friendly infrastructure and inclusive curricula. Moreover, ensuring post-training success through initiatives that promote equal pay, safe working conditions, and inclusive work environments can empower women to excel across diverse fields. Labour market outcomes should be prioritized to ensure the successful entry of TVET graduates into the workforce (World Bank, UNESCO & ILO, 2023). This not only contributes to a more gender-balanced workforce but also inspires other young women to pursue opportunities within the TVET sector, fostering a cycle of empowerment and representation. Fostering a more inclusive and equitable environment where women are empowered to pursue their desired career paths within TVET leads to greater participation and ultimately contributes to sustainable development (UNESCO, 2024).

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