A Case Study on Institute-Industry Collaboration (IIC) at Technical Training Institute (TTI) Chumey: Insights from Institute, Industries, and Graduates

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Abstract

This case study explored how institute–industry partnerships at the Technical Training Institute (TTI) Chumig (formerly TTI Chumey) are shaping the link between classroom learning and real-world skills. In Bhutan's ongoing transition toward a knowledge-based economy—reflected in forward-looking initiatives like the Gelephu Mindfulness City—such collaborations are becoming increasingly vital.

Using a mixed-methods approach, the research engaged 38 participants, including TTI faculty, graduates, and industry professionals, who were selected through purposive sampling. Qualitative data were examined using thematic analysis, while quantitative findings were summarized through descriptive statistics.

The findings show that initiatives like internships and On-the-Job Training (OJT) play a major role in developing trainees' professional skills, practical experience, and confidence for employment. Over 60% of participants expressed optimism about their job prospects as a direct result of these collaborative experiences. However, the study also revealed persistent challenges—such as unclear policy frameworks, weak monitoring mechanisms, limited financial resources, outdated infrastructure, and differing priorities among stakeholders. These issues make it harder for Technical and Vocational Education and Training (TVET) graduates to fully meet the evolving needs of the labour market.

Key enablers of successful partnerships identified in the study include strong leadership, open communication, common goals, and structured collaboration. To strengthen these partnerships, the research recommends adopting the Dual Training Program (DTP) model, which combines classroom learning with guided industry-based training. This model—successfully used in countries such as Germany, the Philippines, and Malaysia—has improved graduate employability and ensured closer alignment between education and industry requirements. TTI Chumig piloted this approach in 2020, with promising results.

By capturing both the achievements and ongoing challenges, the study offers practical insights for nurturing robust institute–industry collaborations. Strengthening such partnerships will be key to equipping Bhutan's youth with the skills, adaptability, and confidence needed to thrive in the country's emerging socio-economic landscape.

Introduction

In Bhutan's evolving socio-economic landscape, collaboration between education, industry, and the community is crucial in shaping employability and sustainable development. As Bhutan transitions from a largely agrarian economy to a knowledge-based and technology-driven one, strengthening community-driven partnerships, particularly in TVET and workforce development, is imperative.

Bhutan's TVET system has traditionally not prioritized industry collaboration as a key component of its learning landscape. Rampant modernization and globalization necessitate a more skills-oriented approach. Industry and community engagement in TVET education can bridge the gap between theoretical learning and practical applications, equipping trainees with relevant skills for the job market. By fostering stronger partnerships, initiatives such as internship training, entrepreneurship programs, apprenticeships, and mentorship opportunities can enhance employability while promoting self-reliance and independence. The involvement of industries in curriculum development and skills training ensures that TVET graduates meet the evolving needs of Bhutan's economy, particularly in priority sectors like tourism, information technology, agriculture, and green energy.

TVET is pivotal in equipping individuals with the practical skills and competencies demanded by modern industries. However, the effectiveness of TVET in producing a workforce that meets industry requirements heavily depends on the strength of partnerships between educational institutions and industry stakeholders. Unfortunately, in many contexts, the collaboration between TVET institutes and industry remains weak, resulting in a persistent mismatch between the skills imparted to trainees and employers' actual needs. This disconnection leads graduates to possess skills that are irrelevant and contributes to a workforce that is inadequately prepared for the realities of the job market (Jaiswal, 2023).

A robust institute-industry partnership is essential for aligning curriculum content with current industry trends, providing trainees with hands-on training opportunities, and exposing them to real-world work environments through internships and apprenticeships (Akinola et al, 2020). When such collaboration is lacking, TVET programs often fail to keep pace with technological advancements and evolving workplace demands. As a result, graduates may find themselves ill-equipped for available jobs, leading to high unemployment rates among TVET alums and a widening skills gap in the labour market. Employers frequently report that TVET graduates require extensive training to reach the expected level of competence, highlighting the inadequacy of their initial preparation.

The repercussions of poor institute-industry linkages extend beyond individual employability. They also profoundly impact the public perception and societal image of TVET graduates. In many societies, TVET is often viewed as a less prestigious educational pathway, suitable only for low-achieving trainees or those unable to pursue university degrees (Akinola et al, 2020). This negative perception is exacerbated when employers express dissatisfaction with the skills of TVET graduates, reinforcing the notion that vocational education does not lead to successful or respected careers. Surveys have shown that nearly half of the youth perceive a negative societal attitude towards TVET, citing reasons such as limited access to the job market, a poor reputation, and limited opportunities for further education. These perceptions can deter prospective trainees from enrolling in TVET programs, further weakening the sector and perpetuating a cycle of underperformance and low status.

Moreover, when collaboration is weak, it limits innovation and slows the continuous improvement of TVET curricula. Without consistent engagement from industry professionals, TVET institutions often find it difficult to keep their programs up to date, invest in modern training facilities, or offer teachers meaningful opportunities for professional growth (Akinola et al., 2020).

This stagnation not only limits graduates' employability but also restricts TVET's ability to contribute meaningfully to national economic development. In summary, the absence of strong institute-industry partnerships undermines the relevance of TVET programs, leaves graduates unprepared for the workforce, and contributes to the sector's low public image. Addressing these challenges requires a concerted

effort to foster meaningful collaboration, update curricula, and enhance the practical training components of TVET to ensure that graduates are equipped with the skills and confidence needed to thrive in today's competitive labour market (Jaiswal, 2023). Thus, this paper examines successful models of industry-education partnerships in Bhutan, highlighting case studies in which public-private collaborations have improved job prospects and economic resilience. It discusses the role of government policies, such as education policy, the TVET Reform Plan 2021, and the Skilling Roadmap 2024, in fostering these linkages. However, challenges remain, including policy misalignment, limited infrastructure, and the need for a shift in mindset toward vocational and technical careers. Addressing these challenges requires strategic policymaking, investment in skills development, and a cultural emphasis on lifelong learning.

Context of the Study

Bhutan is undergoing a significant socio-economic transformation, moving from an agrarian-based economy to one that is increasingly knowledge-driven and technology-oriented. In this evolving landscape, the alignment between education, industry, and community is critical for fostering employability and sustainable development. TVET plays a pivotal role in equipping individuals with practical skills and competencies needed by modern industries. However, the effectiveness of TVET in Bhutan has been hindered by a lack of collaboration between educational institutions and industry stakeholders.

Problem statement

This section emphasizes the pivotal role of TVET institutions in linking education to industry needs, framing their outputs as essential inputs for economic development. As UNESCO (2023) highlights, enhancing training systems requires stronger connections between TVET and labour markets. In a world grappling with youth unemployment, skills mismatches, and gaps have become critical issues. The societal shift from valuing credentials to competencies underscores the urgency for skill-based education. TVET emerges as a key driver of sustainability, poverty reduction, and improved quality of life by equipping trainees with industry-relevant capabilities.

Correspondingly, the TVET system in Bhutan faces a dual challenge: addressing the rising youth unemployment rate and bridging the significant gap in skilled and competent labour needed to diversify the economy. Youth unemployment surged from 11.9% in 2019 to 22.6% in 2020 (NSB, 2020), a further increase exacerbated by the COVID-19 pandemic. While academic education has equipped many young Bhutanese with basic human capabilities, a pressing need remains to strengthen their professional and technical skills, especially in light of evolving technologies and shifting employment patterns.

This growing youth unemployment starkly contrasts with the shortage of skilled labour in sectors such as construction, manufacturing, and agriculture, which continue to rely heavily on foreign workers. The economic slowdown has exacerbated the issue, reducing growth across multiple sectors and leading to job losses and widespread unemployment. Therefore, the TVET system must evolve into a robust mechanism that safeguards youth employability and serves as a sustainable source of skilled labour, now and in the future.

If the key objective of TVET is to prepare youth and others for meaningful employment, then it must be based on a public-private partnership. The logic behind the need for strong collaboration between TVET institutions and industries is that the outputs of TVET institutions should serve as inputs for industries. The skills acquired from institutes and the practical skills needed in industries can be compatible only if TVET programs are well-coordinated. Moreover, TVET is a skill-oriented program that requires facilities for effective implementation. In most cases, industries have better facilities than TVET institutions. The TVET institutions-industry linkage would give trainees access to facilities not available in the institutes and expose them to the real world of work. To establish strong linkages that yield well-rounded TVET graduates, a clear policy or framework is necessary to guide industry and institutions.

The growing gap between academic knowledge and practical skills highlights the need to integrate real-world applications into education. TVET graduates must be job-ready, world-ready, and future-ready. While traditional education provides foundational knowledge, it often lacks practical skill development. Internships, OJT, and industry partnerships are key to bridging this gap. However, a structured system or policy is missing. Strengthening these links enables trainees to apply theory to practice, enhancing their technical skills, adaptability, and confidence for success in a rapidly evolving workforce.

The skills provided by TVET institutions in Bhutan have increasingly failed to align with the evolving demands of the business sector. Many graduates lack the technical expertise and essential soft skills required in the modern workplace, which restricts their employment prospects and hampers economic progress. To develop a workforce that meets industry needs, it is essential to bridge this gap through targeted community education initiatives (MoLHR, 2021).

In Bhutan, institute-industry collaborations are mostly informal and lack structure, resulting in uncoordinated efforts and a misalignment between curricula and industry needs (Gill, 2009). This gap is primarily due to the lack of a robust legal and policy framework. Shi and Zang (2024) highlight how important it is to have strong legal protections in place, pointing to key laws such as the Education Act, the Labour Act 2007, the Occupational Health and Safety Act 2022, and the Regulation on Working Conditions 2022 as vital frameworks for ensuring fairness and safety in the education and work environment. Although the Dual Training Program (DTP) guideline and the Sector Skills Council (SSC) aim to support partnerships, implementation remains inconsistent across TVET institutions.

Further, the GMC, a special administrative region in Bhutan, is a visionary urban development initiative inspired by His Majesty the King. This forward-thinking project aims to seamlessly blend economic progress with mindfulness, holistic well-being, and environmental sustainability. Competent, world-ready, work-ready, and future-ready youths must be recruited to realize this great dream for the nation. This necessitates a versatile, dynamic, skilled workforce that can contribute to the realization of His Majesty's colossal dream. This can be achieved only through a formal, structured partnership between the industry and the institute to provide an authentic learning ecosystem.

At present, TTI Chumig engages in localized partnerships by signing Memorandums of Understanding (MoUs) with willing industries to provide OJT opportunities. While mutually beneficial, this system lacks sustainability, as the institute relies on industries for placements, and industries rely on the institute for helpers. However, this arrangement has not significantly improved the visibility or value of TVET graduates. As a result, the skilled workforce produced by TTIs continues to receive limited recognition from both industry and the general public, leading to a poor perception of their skills.

Significance of the study

This study, centred on TTI Chumig, addresses Bhutan's urgent need to align technical and vocational education with labour market demands and national development priorities. Amidst growing youth unemployment and a shortage of skilled workers in key sectors, the research examines the nature and effectiveness of institute-industry collaboration at TTI Chumig. It highlights how such partnerships can bridge the skills gap between education and industry, enhance the employability of TVET graduates, and support national strategies, such as the Skilling Roadmap 2024 and the TVET Reform Plan 2021. The absence of a formal, structured framework for such partnerships is a significant challenge, and the study offers insights for developing standardized legal, regulatory, and operational mechanisms.

Furthermore, TTI Chumig's case reveals how weak institute-industry linkages contribute to the low public perception of TVET. By showcasing the benefits of robust collaborations—such as improved job placements, enhanced practical skills, and stronger industry engagement—the study advocates for elevating the image of TVET among young people and the broader society. It presents a scalable model for other TVET institutions in Bhutan, offering adaptable, proven practices to foster consistent and effective partnerships. Ultimately, the study outlines a path toward building a workforce that is work-ready, world-ready, and future-ready, contributing meaningfully to Bhutan's economic growth and innovation.

Objectives of the Study

1. Identify how institute-industry collaboration builds skills and addresses knowledge gaps.
2. Find issues and challenges of the current partnership system.

Research Questions

a. What are the key factors that contribute to successful institute-industry partnerships?
b. What are the most common challenges in establishing and maintaining such partnerships?
c. How do industries perceive the value of collaborating with TVET training institutions?

Literature Review

This paper explores the key ingredients that make institute–industry partnerships successful, drawing insights from a wide range of international and local studies. Strong

collaboration between TVET institutions and industries plays a crucial role in maintaining educational quality and relevance. Research from South Africa (Petersen et al., 2016) and elsewhere (Beddie & Simon, 2017) shows that these partnerships help institutions stay current with evolving technologies and workplace practices (Amey & Eddy, 2023). In Bhutan, the government prioritizes TVET to equip youth with globally relevant skills (MoESD, 2025). The National Education Policy emphasizes industry involvement in curriculum and standards development. In 2024, Bhutan established the Sector Skills Council for construction to drive policy-level support for institute-industry collaboration.

Successful collaboration between a TVET institution and an industry partner relies on the partner's technical expertise (Sappa & Aprea, 2014; de Paor, 2018; Keevy et al., 2021) and strong leadership (Remington, 2018; Amey & Eddy, 2023). While the institute staff orient trainees to the professional field, industry partners are responsible for providing hands-on training and supervision. Yusop et al. (2023) emphasize that evaluating trainee interns is a vital part of such partnerships and requires knowledgeable assessors. To meet this need, the TTTRC under DWPSD trained 31 industry representatives in skills supervision to ensure trainees achieve their learning objectives through consistent monitoring and evaluation (DWPSD, 2023).

Njengele et al. (2024) introduce the concept of "boundary-crossing" as a powerful approach for management teams. It describes how institutional leaders can learn expansively by stepping outside their usual routines to engage with diverse groups such as industry stakeholders. Through such interactions, they encounter new ideas that challenge established assumptions and provoke deeper reflection about work roles, relationships, and structures. This kind of expansive learning encourages institutions to reimagine how they operate and collaborate, often leading to more innovative and sustainable outcomes. In Bhutan, however, participation from both the institute and industry management remains limited, mainly due to weak policy support and shortages of qualified professionals. Edmondson et al. (2012) similarly argue that strong leadership and networking skills are vital for attracting and maintaining industry collaborations. At institutions like TTI Chumig, principals often take the lead in identifying partners, but industries frequently struggle to sustain engagement because of staff constraints (MoLHR, 2021).

Building meaningful partnerships also requires that educational goals align closely with industry needs. Pillay et al. (2014) emphasize that such alignment not only improves the quality of training but also ensures that graduates are ready for work. In Cambodia, for example, robust collaboration between the private sector and TVET institutions has produced benefits like industry-designed curricula, student internships, and joint research activities. These efforts bridge skill gaps and enhance employment opportunities. However, despite the clear advantages, many such collaborations remain short-term or ad hoc due to weak policy enforcement, lack of trust, and limited institutional capacity (Veung, 2024). Strengthening these partnerships calls for clear agreements, teacher and institutional training, supportive legal frameworks, and explicit inclusion of collaboration goals in institutional action plans. This collaborative approach offers several advantages beyond initial goals. Regular communication and joint efforts help institutions meet their objectives without surprises and facilitate valuable formal and informal exchanges of knowledge and technology. Diverse participants benefit from mutual learning, fostering growth across teams and organizations. Preparing the industry ahead of projects is crucial, allowing time to hire, organize, optimize equipment use, and ready support systems and finances. Wangchuk (2023) also found that industrial training promotes continuous learning, enhancing trainees' knowledge, intellectual capacity, and understanding of their studies, further strengthening the effectiveness of these partnerships.

Institute-industry collaborations face common challenges, including internal restructuring, loss of key personnel, changes in project scope, partner withdrawal, delays, and budget overruns. Smaller companies often struggle with development costs, particularly when they lack guaranteed future sales. Wangchuk (2021) reported that irregular or delayed stipends during on-the-job training (OJT) reduce motivation and strain students' economic stability. Ensuring timely payment is therefore essential for successful outcomes. Similar concerns appear in other developing contexts. In Nigeria, for example, Aloysius et al. (2018, as cited in Akinola et al., 2020) identify persistent challenges, including mismatched curricula, minimal industry involvement, insufficient funding, outdated facilities, and a shortage of qualified instructors. Bhutan's TVET programs face many of these same obstacles, leading to a gap between graduate competencies and industry expectations.

Addressing these systemic issues is critical for both countries to strengthen their TVET systems and support sustainable economic development.

While existing research highlights good practices and common challenges, there remains a lack of empirical evidence about what actually makes these partnerships work in practice. This study aims to address that gap by examining how TTI Chumig collaborates with industries in Bhutan. This case study will provide deeper insights into how institute–industry partnerships operate on the ground, identify factors that contribute to their success, and explore how such models can be scaled sustainably within the TVET sector.

Methods

Developing a sound research methodology is essential for giving structure and direction to any study. It provides a clear plan that helps researchers stay organized and make the best use of available resources. A methodology typically includes elements such as sampling, observation techniques, and statistical or operational designs that together form the foundation of a systematic investigation. Research methodology, as Singh and Nath (2005) explain, is like a roadmap that guides researchers from identifying a problem to concluding. It ensures that the study remains scientific, valid, and credible at every step. More than just a collection of techniques, methodology involves the thoughtful and purposeful use of those methods. When applied with care, they lead to findings that are meaningful and trustworthy. However, when used carelessly, they can undermine the entire study—reminding researchers of the importance of precision and understanding in every methodological choice they make.

In this study, a mixed-methods approach was employed, integrating both quantitative and qualitative data to provide a comprehensive understanding of the topic. Specifically, a convergent parallel research design was used to explore the views of TVET trainers, graduates, and industry employers on TTI Chumig's current practices related to industry partnerships. This design also allowed the study to identify and analyze the factors that contribute to the success of these collaborations, capturing both statistical trends and rich, contextual insights from participants.

Participants/Sample

A purposive sampling strategy was used to ensure the inclusion of key stakeholders directly involved in or affected by institute-industry collaboration. The idea was to maximize the benefits for those who had experience with OJT and the MoU signed industry partners. The main participants include:

- TTI Chumig management and faculty members (19)
- Industry partners who have engaged in an MoU with the institute (7)
- Recent graduates and current trainees who have participated in OJT or industry placements (12)

This diverse group provides a broad view of the collaboration's effectiveness, challenges, and impact on skill development.

Data Collection Tools

Data is collected using multiple methods to ensure triangulation and depth:

1. Semi-structured interviews with institute management, faculty, industry representatives, and graduates to gather in-depth perspectives on collaboration practices and outcomes.
2. Survey Questionnaire to be administered to trainers, faculty and the industry to explore their experiences and perceptions regarding OJT and industry exposure. Pilot testing of the questionnaire was conducted with the faculty of another institute to ensure internal consistency.

Data analysis method

As a mixed-method research design, semi-structured questions were posed to the experts in person. Consequently, the qualitative data were subjected to thematic analysis. Descriptive statistics, such as frequency, percentage, and mean, were used to analyze the quantitative data from the online survey. The themes of the qualitative data were arranged according to semi-structured questions. Similar remarks and responses from the participants were grouped under the same theme, while the more elaborate points were categorized by domain.

Validity and reliability

The researchers designed the instrument for the online survey based on the literature and feedback from faculty and industry experts in the field of TVET. The construct validity is maintained by members checking and conducting a trial with faculty from the other institute. It was revised based on the feedback received from trainers and trainees who

were not part of the sample. Cronbach's alpha reliability technique was used to determine the internal consistency of the questionnaire items. A reliability coefficient of 0.784 was obtained using SPSS. After evaluation, it was determined that the instrument's face validity and content were appropriate. Respondents had access to the survey through email and WhatsApp.

Ethical consideration

The study was initiated after obtaining approval from the MoESD to conduct the research. Following an explanation of the study's objectives and their rights, prospective participants will be given the option to discontinue participation at any time. Before conducting the interviews, written consent had been obtained from each participant. To protect their privacy and maintain the study's anonymity, care was taken to ensure that participants could not be easily identified.

Results

Respondent demographic

The Institute category is the largest source of respondents, with 19 participants. In contrast, the industries category provided the fewest respondents, with only seven. In every category, there are more male respondents than female respondents. Across all 38 respondents, males account for approximately 68% (26 out of 38), while females account for about 32% (12 out of 38). This shows a significant overall skew towards male participation in this sample. The trend is no exception, as evidenced by the interview participants, where, among the five interview participants, 100% were male, highlighting a complete absence of female perspectives in the qualitative data collection phase. See Figure 1.

Respondents' Qualifications

47% of respondents had a diploma as their highest qualification, indicating that nearly half of the surveyed workforce has mid-level technical or professional education. Only 5% of respondents held a degree, suggesting limited representation of higher academic qualifications among the participants. 29% had completed Class Twelve, showing a significant portion of respondents with only higher secondary education. All individuals interviewed were at the managerial level or were company owners, implying that the qualitative data collected represents insights from decision-makers or those with significant authority in their organizations. See Figure 2.

Positive outcomes observed from institute-industry collaboration

Based on the collected data, the majority of respondents acknowledged the positive impacts of institute-industry partnerships. Over 60% indicated that these collaborations create valuable opportunities for trainees to enhance their professional development. Additionally, many respondents believed that such partnerships improve trainees' job readiness to meet market demands and provide an excellent platform for them to gain exposure to current industry practices. Data from graduates further revealed that 33% felt very confident and 67% felt confident in their jobs after completing their OJT/internship. This underscores the critical role and importance of these programs in equipping trainees with the skills necessary for successful employment. While 40% of the interview participants also shared that trainees'

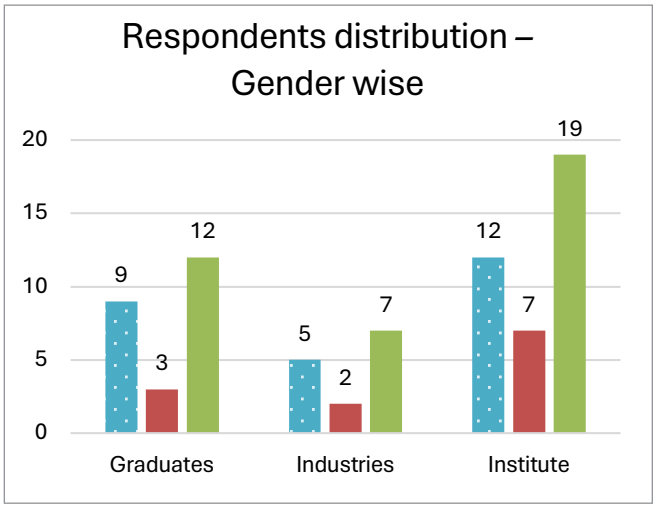

Figure 1. Respondents' distribution—gender wise

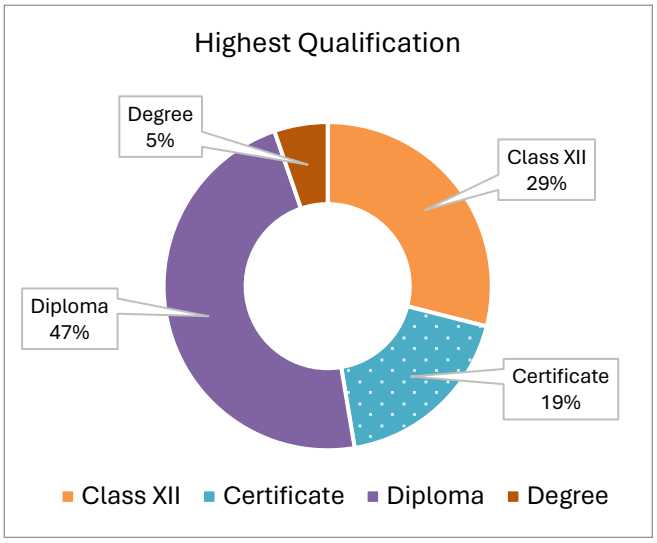

Figure 2. Respondents' qualification status

OJT helps address the shortage of human resources in the companies. See Figure 3.

Current practice for initiating collaboration by the institute

According to 81% of respondents, the institute primarily initiates collaboration with partnering industries through formal agreements, such as signing Memorandums of Understanding (MoUs). Some industry representatives mentioned that collaboration is also initiated by sending trainees for short-term on-the-job training (OJT) as needed, although this occurs infrequently. Other methods of initiating collaboration include industry outreach programs, individual initiatives, and personal contacts. Initiating collaborations through informal conversations happens very rarely. See Figure 4.

Importance of institute-industry collaboration components

The data indicates that clear communication is viewed as the most critical factor for achieving effective institute-industry collaboration. For industry representatives, transparent and shared objectives were highlighted as the most important component, whereas trainers placed greater emphasis on the need for strong leadership and management support. Overall, all six components were rated as important by more than 60% of respondents, suggesting that each element should be addressed to ensure a successful and effective institute-industry partnership. Likewise, all interview participants (100%) recommended that institutes conduct OJT monitoring visits, citing reasons such as tracking trainees' learning progress, discussing objectives and challenges, and helping trainees feel supported and valued. Over 60% of the companies also agreed to assist the institute by sharing their expertise and visiting as guest speakers. See Figure 5.

Effectiveness of collaboration institute-industry (is) elements currently in place

The data indicates that most aspects of the current collaboration are rated as only fair or reasonable. Alarmingly, from the industry's perspective, none of the collaboration elements received a rating of 'very good' or 'excellent', highlighting the urgent need for immediate action to address these shortcomings. For the institute, ensuring the availability of adequate resources appears to be the most pressing concern at this time. Meanwhile, for industries, improving monitoring and evaluation processes and establishing clear communication should be prioritized within current practices. To support the finding, most of the interview participants also highlighted the need for formalized policies and regular monitoring. See Figure 6.

Severity of challenges faced currently related to institute-industry collaboration

The data shows that all aspects of institute-industry collaboration present varying degrees of challenge severity. Eighteen per cent of respondents identified the most severe challenges as the lack of regular monitoring and evaluation, as well as the absence of clear and shared objectives. Graduates specifically highlighted the lack of adequate resources as the most pressing challenge, while they considered the lack of regular monitoring and evaluation as the least severe issue. For industry representatives, the absence of a formalized policy and framework emerged as the most severe challenge,

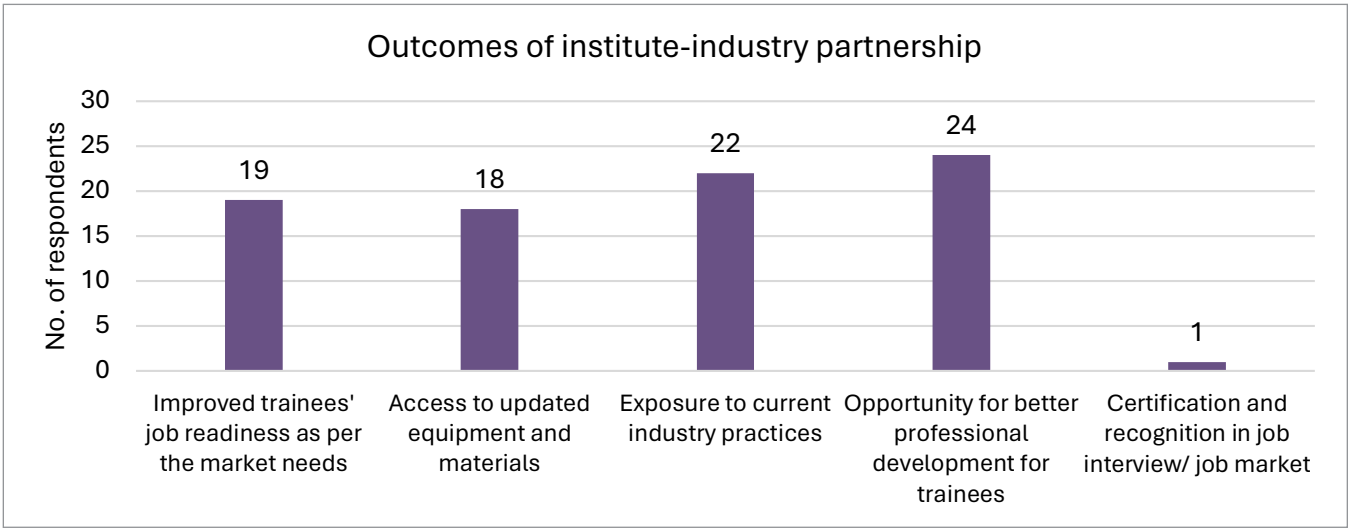

Figure 3. Outcomes of institute-industry collaboration

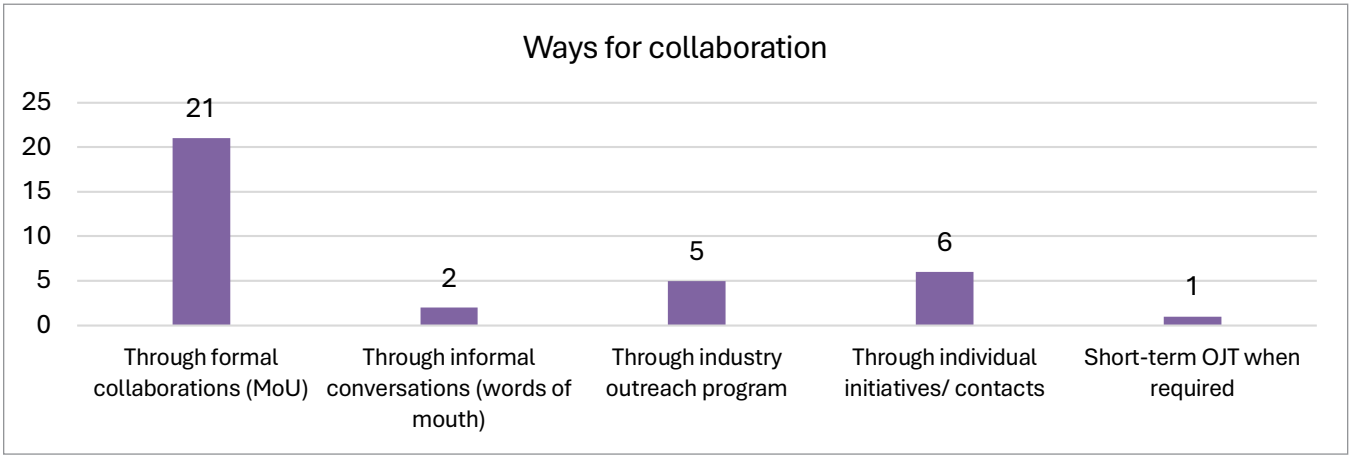

Figure 4. Methods of collaboration

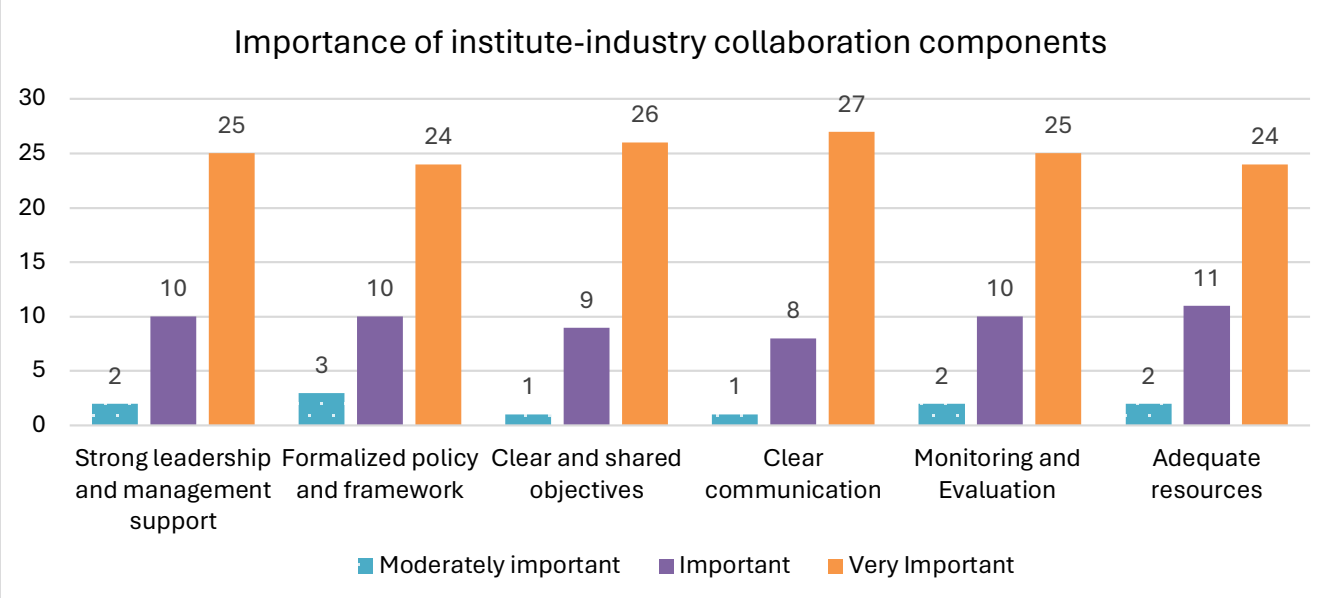

Figure 5. Importance of Institute-Industry collaboration

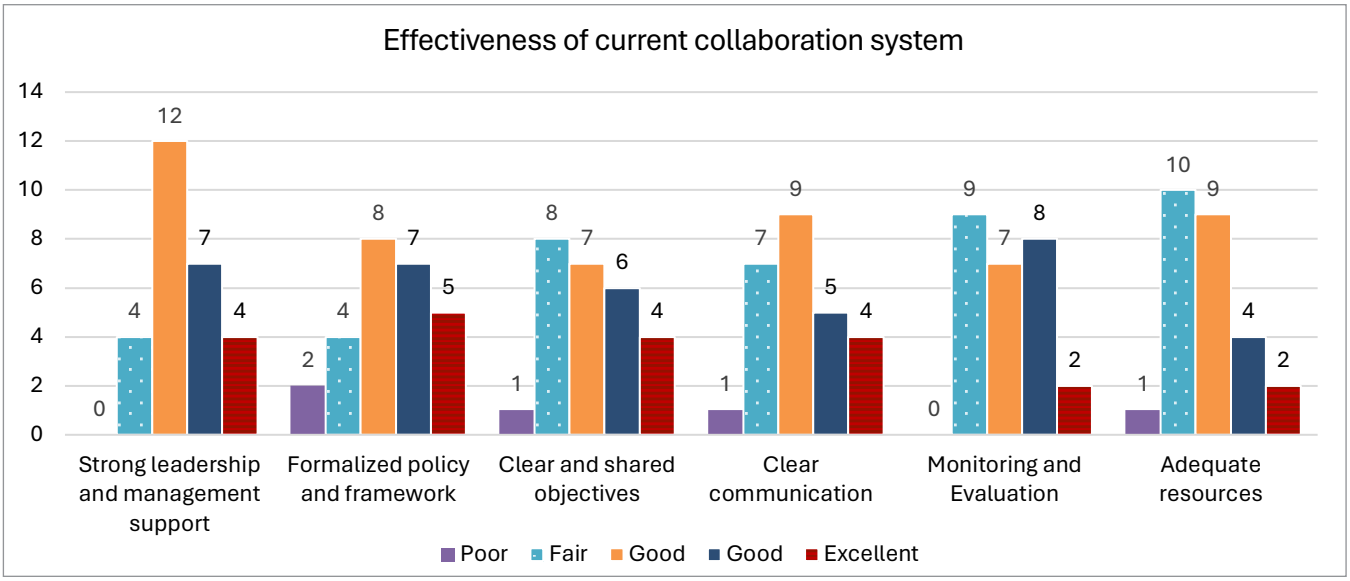

Figure 6. Effectiveness of the current collaboration system

whereas limited support from management and leaders was viewed as the least concerning. Institute trainers also pointed to insufficient resources as their primary challenge, with lack of support from management and leaders being the least significant issue they faced. The findings are also supported by interview responses, in which 80% of participants expressed the need for well-framed policies. They stated that the current MoU between the institute and partnering companies does not adequately reflect the OJT requirements. Due to the lack of proper policies, companies sometimes fail to be aware of trainees' learning objectives during OJT and tend to remain indifferent. See Figure 7.

Clarity of industries and trainers regarding the institute-industries collaboration's goals and expectations

The findings reveal that many trainers and employees in partner industries lack a clear understanding of the institute's goals and expectations for the industry collaboration. Only 42% of respondents reported being completely clear, while 15% were somewhat clear, and 39% indicated they were still unclear about these goals and expectations. Similarly, 40% of interview participants reported being unaware of the objectives of the OJT or training, despite trainees keeping logbooks. Consequently, 60% of participants emphasized the need for clear and shared objectives for the OJT program. See Figure 8.

Current practice of monitoring and evaluation of collaboration/OJT done

Half of the respondents from both the institute and the industry agree that monitoring and evaluation of ongoing collaboration are conducted occasionally. Approximately 27% believe that such monitoring is conducted infrequently, suggesting inconsistency in the practice. Only 8% of respondents report that monitoring and evaluation occur regularly. The finding is also supported by the interview responses, in which 40% of participants reported that monitoring occurs very rarely and recommended that the institute establish a regular monitoring system. See Figure 9.

Department/ Ministry's support in enhancing institute-industry collaboration

The data shows that the department or ministry plays a crucial role in enhancing institute-industry collaboration. About 62% of respondents from both sides believe authorities should focus on strong leadership, management, and formalized policies. Industry representatives stress the need for clear, shared objectives, while institutes emphasize leadership and policy development. Interviewees also call for higher authority involvement in providing financial support to industry experts visiting institutes, sharing master trainers, offering contracts to partner companies, and introducing new courses aligned with market demands. See Figure 10.

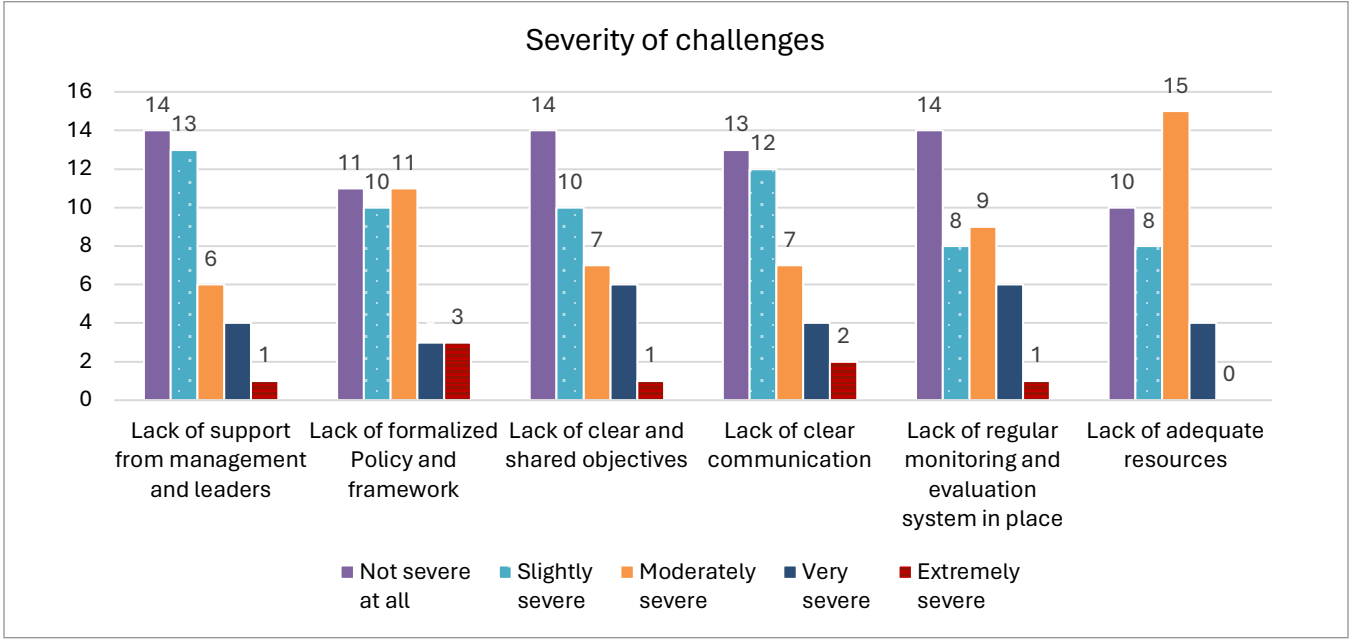

Figure 7. Severity of challenges of the current practices

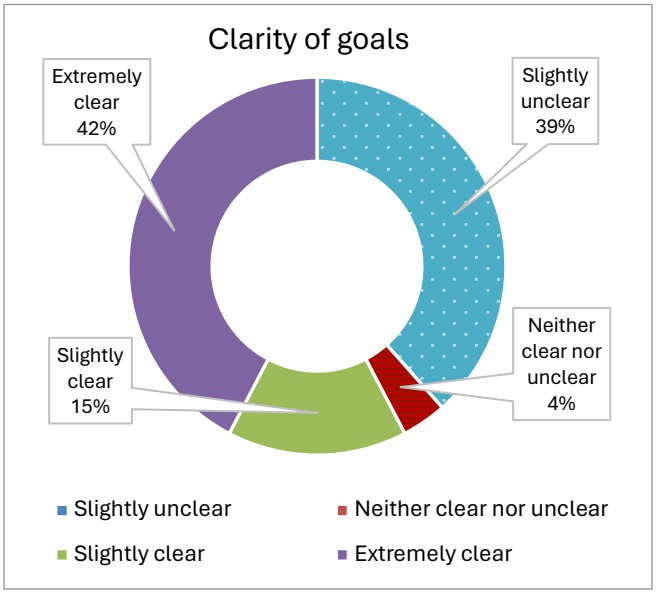

Figure 8. Clarity of partnership goals

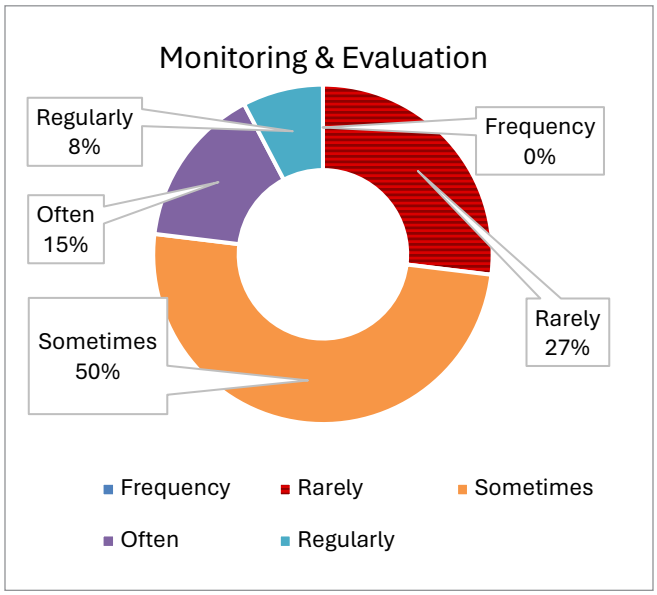

Figure 9. Monitoring status of the current partnership

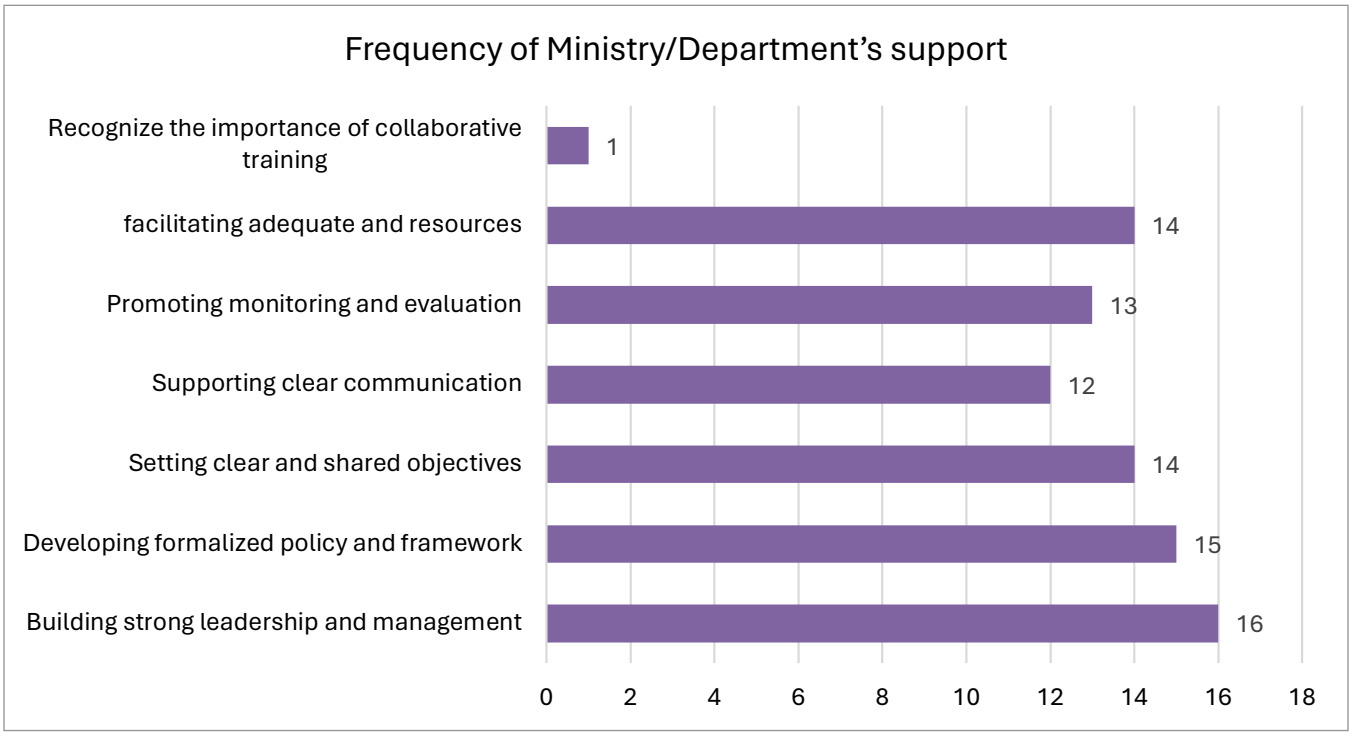

Figure 10. Frequency of Ministry/Department's support

Ways to enhance collaboration between the institute and industries

A suggestion to enhance collaboration was requested in both the survey and the semi-structured interview. The following were the emerging themes in enhancing the institute-industry partnership:

- Need for clear communication and policies while collaborating with different key players (staff, employer and stakeholders)
- Technology and machinery need to be updated in the institute
- Timely monitoring and evaluation of trainees' OJT
- Align the goals and expectations of the industries and the institute
- Policies and frameworks need to be developed collaboratively between the institute and industries, in the presence of the Ministry

- The duration of OJT needs to be extended.
- Recommended to implement DTP training modality, which has proven effective in providing the required hands-on experience for trainees

Discussion

This study examined how faculty members, industry partners, and graduates perceive the institute–industry collaboration initiated by TTI Chumig to address skills gaps. It also aimed to bridge an existing empirical gap identified earlier, as no previous research had explored such collaborations within Bhutan's Technical Training Institutes (TTIs).

The TTI Chumig case study highlights both the strengths and challenges of institute–industry partnerships in Bhutan's TVET sector. More than 60% of respondents agreed that such collaborations enhance trainees' job readiness and professional growth. These findings are consistent with UNESCO and World Bank recommendations that internships and apprenticeships serve as critical bridges between education and employment. Similarly, Wangchuk (2023) found that industrial training promotes lifelong learning and deepens intellectual capacity, while Amey and Eddy (2023) noted that effective collaboration enables TVET institutions to remain responsive to technological and economic changes. On-the-Job Training (OJT) was found to build confidence, strengthen teamwork, and improve problem-solving skills among trainees. Noel (2014) also emphasized the broader benefits of community engagement in higher education, noting its capacity to foster social responsibility and enhance learning outcomes—benefits that align closely with Bhutan's vision for youth development through TVET.

Overall, the study affirms that structured and purposeful industry partnerships are vital to ensuring TVET programs remain responsive to a rapidly changing labour market. Both quantitative and qualitative data indicate that clear communication and shared objectives between institutes and industries are the most critical factors driving successful collaboration. This finding echoes Venug (2024), who argued that partnerships thrive when organizations work collaboratively toward shared goals. Similarly, Awasthy (2020) underscored the role of interpersonal communication in sustaining effective relationships. Regular meetings, open dialogue, and diverse communication platforms—ranging from digital media to face-to-face interactions—were identified as practical ways of strengthening coordination. Implementing well-defined monitoring and communication mechanisms, including follow-up procedures, is therefore essential to maintain synergy between partners.

However, the findings also reveal that the current level of institute–industry collaboration remains below expectations. Most respondents rated existing practices only as "fair" or "reasonable," with no aspect considered "very good" or "excellent." The absence of a clear industry policy or framework emerged as a major concern. Both survey and interview responses emphasized the need for formalized guidelines and consistent monitoring frameworks to ensure the sustainability of partnerships. Supporting this, Awasthy argued that policy interventions are crucial for strengthening collaboration and managing the complex interface between academia and industry. While Memoranda of Understanding (MoUs) are common starting points, they often lack sufficient detail to guide long-term cooperation. Notably, 80% of surveyed stakeholders called for comprehensive policies that define objectives, roles, and evaluation strategies more explicitly.

Despite the benefits of existing collaborations, several important gaps remain. Monitoring and evaluation (M&E) processes are particularly weak—only 8% of respondents reported regular oversight, while half indicated that M&E occurs only occasionally. This irregularity undermines accountability and contributes to mismatched expectations between institutes and industries. Proper monitoring not only assures trainees of the quality of their learning experience but also provides a vital feedback mechanism. Wangchuk (2023) highlighted the importance of supervisors conducting regular visits to assess trainee performance and engagement, reinforcing the value of systematic follow-up during OJT placements.

Resource limitations further constrain the effectiveness of partnerships. Graduates identified inadequate stipends during OJT as a major source of frustration, while trainers and industry representatives cited outdated equipment and staffing shortages as ongoing challenges. Wangchuk (2023) also observed similar concerns among Jigme Namgyel Engineering College (JNEC) trainees, for whom delayed or insufficient stipends were a significant demotivating factor. Ensuring timely and adequate financial support could therefore play a critical role in sustaining trainee motivation and improving learning outcomes.

In conclusion, institute–industry partnerships in Bhutan's TVET sector hold enormous potential but require structural reform to realize it fully. Strengthening monitoring and evaluation systems, formalizing policy frameworks, improving communication, and addressing resource shortfalls are all essential to ensure these collaborations produce skilled, adaptable, and future-ready graduates. A systematic and well-supported partnership model will not only enhance training quality but also contribute to Bhutan's long-term goals of inclusive and sustainable workforce development.

Implications

The study recommends supporting and encouraging industries to partner with TVET institutions through government-backed incentive policies. Clear goals and procedures should be established within a partnership framework, with institutes regularly monitoring trainees during on-the-job training (OJT) and extending the duration as needed. The Dual Training Program (DTP) modality is highlighted as the most effective approach for fostering industry partnerships across TVET institutions (Subrahmanyam et al, 2018). Implementing these measures will help minimize the gap between cooperative training requirements in TVET and the actual work demands of industries, enhancing graduate readiness.

Limitations

Although the study offers valuable insights into industry–institute collaboration within Bhutan's TVET sector, it is subject to several important limitations. First, the case study focuses solely on TTI Chumig, which restricts the generalizability of the findings. Institutional structures and socioeconomic contexts vary across other technical institutes in Bhutan and beyond, meaning that the results may not fully represent the broader TVET landscape. Second, the relatively small sample size—particularly among interview participants and industry representatives—limits the diversity of perspectives captured. The study also reflects a noticeable gender imbalance, which further influences the comprehensiveness of stakeholder viewpoints.

Moreover, the study did not adopt a longitudinal design, making it difficult to assess the long-term effects of institute–industry collaboration on graduate employability or industry satisfaction. As a result, the findings primarily reflect current perceptions rather than ongoing or evolving impacts. Finally, while the research highlights policy gaps and structural challenges, it does not explore in depth the root causes of weak implementation or systematically evaluate existing government mechanisms. Addressing these areas could provide a more complete understanding of the underlying factors that shape the success or limitations of such collaborations.

Conclusion

The case study on TTI Chumig highlights both the transformative potential and current limitations of institute-industry partnerships within Bhutan's TVET system. These collaborations enhance trainees' employability, confidence, and workforce readiness, particularly through internships and on-the-job training (OJT), bridging the gap between academic knowledge and industry needs. Most respondents agree that partnerships expose trainees to modern industry standards, improving their skills and adaptability. However, partnerships remain mostly informal, irregular, and lacking strategic depth. While Memorandums of Understanding (MoUs) aid short-term agreements, they fall short of providing long-term policy support. Stakeholders identified limited monitoring, lack of shared objectives, outdated equipment, and insufficient stipends as significant challenges. A poor understanding of training goals by industry personnel and weak communication channels also undermine the effectiveness of training. The study raises concerns about the small sample size and limited gender diversity, which may impact inclusivity and generalizability.

To address these issues, formalized collaboration frameworks with clear policies, accountability, and defined roles are urgently needed. Strengthening partnerships requires regular monitoring, better curriculum alignment with industry demands, modern training facilities, and incentives for industry engagement. Implementing comprehensive programs, such as the Dual Training Program (DTP), and establishing institutional career services could further close the skills gap.

Ultimately, Bhutan's progress toward a sustainable, knowledge-driven economy depends on cultivating skilled, future-ready graduates. Robust institute-industry partnerships grounded in clear policies and mutual goals are essential for national development and visionary projects such as the Gelephu Mindfulness City. Strengthened TVET collaboration will empower young people, boost their employability, and enhance their economic resilience.

Note on Contributors

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