

# Exploring Technical Vocational Teacher Education: Inputs to Curriculum Model Development

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DOI: <https://doi.org/10.30880/jtet.2025.17.02.006>

## Article Info

Received: 16<sup>th</sup> December 2024  
Accepted: 29<sup>th</sup> April 2025  
Available online: 30<sup>th</sup> June 2025

## Keywords

BTVTEd curriculum model, technical vocational teacher education curriculum, issues and challenges, emerging disciplines, curriculum enhancement practices

## Abstract

The global demand for skilled workers, particularly in digital sectors, is projected to increase significantly, with an estimated 92 million digital jobs expected by 2030, according to the World Economic Forum. This trend presents a unique opportunity for countries like the Philippines to enhance their Technical and Vocational Education and Training (TVET) systems to meet evolving global labour market needs. Hence, this study endeavoured the development of a comprehensive, research-based curriculum model for the Bachelor of Technical-Vocational Teacher Education (BTVTEd) program in the Philippines. Using an exploratory sequential mixed-methods approach, the research examined current challenges, and the extent of knowledge, experiences, and practices within the BTVTEd curriculum by gathering insights from experts in universities across the country. The findings reveal that the main challenges identified by respondents are related to curriculum and program design, particularly in adapting to industry demands. However, issues related to resources and facilities were also highlighted as central concerns. The study recommends adding key courses like research, innovation, and sustainability, strengthening core areas, and identifying strategies to enhance the BTVTEd program. Based on these findings, a new curriculum model is proposed, aimed at strengthening the current technical education program. The research concludes that aligning the curriculum with industry needs, adding emerging fields, and strengthening pedagogy can greatly improve TVET quality and graduate employability. The study suggests further exploration on how universities balance the use of quality assurance practices in curriculum delivery. The results provide valuable insights for the continued development of technical vocational teacher education in the Philippines through comprehensive quality assurance.

## 1. Introduction

The global demand for skilled workers has been on the rise and is expected to grow further, as projected by the World Economic Forum. The rapid pace of technological advancement continues to shape the labor market significantly. By 2030, the World Economic Forum estimates that the number of digital jobs will reach

approximately 92 million. This projected growth in digital employment presents a substantial opportunity for lower-income countries, such as the Philippines, to strengthen and expand their Technical and Vocational Education and Training (TVET) systems to meet the demands of the global economy.

The Philippines ranked 69 of 103 countries in the 2021 Global Skills Report based on three major skills – Business (competitive), Technology (Emerging) and Data Science (Emerging). Ranking is based on four levels – Cutting-Edge, Competitive, Emerging, Lagging (Batapa-Sigue, 2021). This has been predetermined since 2013 when the country has experienced significant "brain and brawn drain," as reported by the Technical Education and Skills Development Authority (TESDA). In response to this skills gap, three key educational agencies in the Philippines have collaborated to address the issue. The Department of Education has implemented the K-12 program, aimed at providing students with quality education aligned with international standards and global recognition. On the other hand, the Commission on Higher Education (CHED) has released CMO Nos. 78 and 79, Series of 2017, as the newest technical vocational education programs to guide Philippine higher education institutions in preparing and training Technology and Livelihood Education (TLE) and Technical-Vocational (Tech-Voc) teachers catering for a variety of educational settings, including Grades, Grades 9-10, Senior High School (SHS) TVET tracks, and tertiary-level TVET programs. Meanwhile, TESDA is tasked with setting appropriate skills standards and assessments, coordinating manpower policies and programs, and providing policy direction for resource allocation to TVET institutions across both private and public sectors ([tesda.gov.ph](http://tesda.gov.ph)).

The core curriculum of the technical vocational teacher education programs plays a crucial role in equipping aspiring teachers with the necessary knowledge, skills, and attitudes to effectively deliver broad range pedagogy, technology, and skills education to students. However, the existing literature highlights several issues and gaps that warrant further examination to improve the quality and effectiveness of this curriculum (Martinez, 2022). One of the key issues identified is the need to align the curriculum with the changing demands of the technical and vocational education landscape (Alinea, 2021). Le et al, (2022) emphasized that the technical-vocational teacher education curriculum stands as a cornerstone in shaping educators who can effectively transmit practical skills and knowledge, yet it faces persistent challenges in keeping pace with the dynamic demands of modern industries. A significant gap lies in the integration of emerging technologies, such as artificial intelligence, automation, and advanced manufacturing processes, which are rapidly transforming various sectors. Many existing curricula lack comprehensive training in these areas, leaving teachers ill-equipped to prepare students for the future workforce. Dhakal et al., (2018), explained in the study that governments, industry, and educational institutions across the Asia-Pacific region have highlighted the mismatch between the skills of graduates and the skills required for job entry positions, suggesting that the instructional and course designs are not adequately aligned with the skill needs of the industry. This disconnect between the curriculum and industry needs is a significant constraint on future economic development. Furthermore, the low status of vocational education and the problem of increasing the status of the teaching profession in general are identified as major obstacles to the professionalization of teachers in vocational education (Grollmann, 2008) (Ye et al., 2024).

Budiasih and Wijayanti (2020) concluded that these challenges highlight the need for a comprehensive review and restructuring of the technical-vocational teacher education curriculum to better prepare teachers for the realities of the classroom and industry. Beyond the need to produce skilled workers, it is equally crucial that the Philippine government examines how higher education institutions are preparing technical teachers, who play an essential role in training the future labor force. Since the Policies, Standards, and Guidelines (PSG) for the Bachelor of Technology and Livelihood Education (BTLEd) and the Bachelor of Technical-Vocational Teacher Education (BTVTEd) have been recently established, research assessing the effectiveness of these programs is limited. Furthermore, much of the existing literature has focused primarily on academic-industry partnerships, with little exploration on the significance of its learning framework and courses including the breadth and application of knowledge within institutions that offer technical vocational teacher education.

Through addressing the cited perennial and contemporary gaps, the TVET institutions can be assisted in understanding how they will be able to improve existing TVET programs and develop a much contextualized curriculum for their undergraduate students. Moreover, potential and emerging issues and concerns that may require much attention to further study on curriculum and how it will better equip graduates to address the demand of the real world will be uncovered. While Alinea, (2023) concluded that these gaps may necessitates a fundamental shift towards competency-based education, where learning outcomes are directly tied to industry-defined skills and abilities, Fantinelli et al., (2024) affirms that the curriculum needs to incorporate more opportunities for practical, hands-on experience, such as internships, apprenticeships, and industry-based projects, to bridge the gap between theory and practice.

Hence, this exploratory sequential mixed-method study aims to develop a research-based and robust curriculum model for undergraduate technical vocational teacher education programs particularly, the Bachelor of Technical Vocational Teacher Education (BTVTEd). The new model will be built upon examining and assessing perennial and current issues, challenges and concerns alongside knowledge, experiences and practices of selected experts from across universities in the Philippines offering technical vocational teacher education programs.

Furthermore, the findings will inform the design of the new curriculum model to strengthen the existing technical vocational teacher education programs and policies. Specifically, the study seeks to address the following research questions:

1. What issues, challenges, and concerns are encountered in the current BTVTEd curriculum?
2. What key courses, learning areas, or components should be included in the BTVTEd curriculum?
3. What practices are employed to enhance the BTVTEd curriculum?
4. What factors contribute to the improvement of the BTVTEd curriculum?
5. What strategies are utilized to enhance the BTVTEd curriculum?
6. Is there a significant difference in the assessments of the respondents on the issues, challenges, and concerns; key courses, learning areas, or components; and factors contributing to enhancing the BTVTEd curriculum?
7. What curriculum model may be developed for RTU undergraduate technical vocational teacher education?

The outcomes of this study will contribute to a more comprehensive understanding of the BTVTEd curriculum's strengths and areas for development, serving as a foundation for policy recommendations and curricular enhancements in technical vocational teacher education.

## 2. Methodology

### 2.1 Research Method

This study employed an exploratory sequential mixed-method approach, with qualitative analysis conducted first, followed by a quantitative phase. According to Creswell (2003), the exploratory sequential mixed-method design is versatile because it allows researchers to explore a concept qualitatively before validating it quantitatively. In this approach, researchers construct instruments based on qualitative insights, which are then verified through quantitative analysis.

The qualitative phase employed phenomenological research to explore the experiences of department heads, deans, and faculty members with industry experience in implementing the BTVTEd curriculum. A semi-structured one-on-one interview was developed to gather participants' perspectives on: (a) challenges, issues, and concerns within the BTVTEd curriculum; (b) key courses, learning areas, or components that should be incorporated into the curriculum; (c) practices used to enhance the curriculum; (d) factors contributing to curriculum enhancement; and (e) strategies employed by departments to improve the BTVTEd curriculum. Using thematic analysis, codes and themes were derived from these expert interviews.

### 2.2 Data Collection

In alignment with the university's research protocol, the study received clearance from the Review and Ethics Committee prior to data collection. Purposive sampling was employed to identify the expert participants of the qualitative data. In selecting the expert participants, the following criteria were set and determined by the researchers: a) must be former/current department head or dean of the BTVTEd program, or faculty member with industry experience or experience in developing, implementing, and evaluating the BTVTEd curriculum in their universities; b) with at least 10 years in the academe; c) holds master's degree and doctorate degree or units in doctorate program. An invitation to participate, along with informed consent forms, was sent via email to the selected department heads, deans, and faculty members with industry experience at various universities offering BTVTEd programs in the Philippines. A total of fifteen participants voluntarily agreed to participate in the qualitative study, and individual interviews were subsequently scheduled to gather insights on their experiences with the BTVTEd curriculum. Each interview was transcribed by the researchers, resulting in individual transcripts for each participant. The thematic analysis of the qualitative data informed the development of a survey questionnaire for the study's quantitative phase.

Before distributing the survey, the researchers obtained approvals from the university's Data Privacy Office, the Dean of the College of Education, and the department head of the BTVTEd program. The survey questionnaire, which included informed consent, was then distributed to selected administrators, faculty members, students, and alumni of the BTVTEd program via Google Forms. A total of 305 respondents voluntarily completed the survey for the quantitative phase. Participants and respondents were informed of the potential risks and benefits of participating in the study. They were also assured that the anticipated benefits of the research outweighed any potential ethical concerns.

## 2.3 Data Analysis

During the qualitative phase, researchers used NVivo software to perform thematic analysis on the qualitative data. To prepare the data, transcripts were created for each participant, and a classification sheet containing demographic profiles was developed in Excel. Both the transcript files and classification sheet were imported into NVivo for coding. Description-focused and interpretation-focused coding strategies were applied to analyse and interpret relevant responses from participants. The codes were then organized and labelled, resulting in three to four themes per research question.

Themes generated from the qualitative study of the issues, challenges, or concerns; key courses, learning areas, or components; practices employed to enhance the BTVTEd curriculum; factors contributing to the improvement of BTVTEd curriculum; and strategies utilized to enhance the BTVTEd curriculum were utilized as the variables for the qualitative study. The developed survey questionnaire instrument was administered to the administrators, faculty members, and students of the BTVTEd in the Rizal Technological University. To identify the predominant issues, challenges, and concerns encountered in the BTVTEd curriculum, levels of practice to enhance the BTVTEd curriculum, levels of influence of the factors contributing to enhance the BTVTEd curriculum, and levels of importance of the strategies to enhance the BTVTEd curriculum, the researchers constructed three statements for each identified variable. Moreso, all courses found under the variables relevant to the key courses, learning areas, or components were listed to determine its level of importance among the respondents.

In the quantitative phase, a survey questionnaire using a five-point Likert scale was distributed to the target respondents. IBM SPSS Statistics 22 was used to analyze the quantitative data and address the inferential questions of the study. Specifically, descriptive statistics were also utilized to demonstrate the responses of the respondents and ANOVA to test differences of the respondent's perspective on: (a) challenges, issues, and concerns within the BTVTEd curriculum; (b) key courses, learning areas, or components that should be incorporated into the curriculum; (c) factors contributing to curriculum enhancement.

The expert participants included one college dean, six current department heads, five former department heads, and three faculty members with industry experience. In terms of age distribution, seven participants were aged 41–50 years, four were aged 31–40 years, three were aged 51 years and above, and one participant was aged 21–30 years. Of the 15 participants, six hold doctoral degrees, another six are currently pursuing doctoral degrees, and three hold master's degrees. Regarding years of service, six participants have served in public education for 11–20 years, five for 21–30 years, three for 10 years or less, and one participant has served for over 31 years. All 15 participants are affiliated with different state universities in the Philippines.

To validate the findings from the qualitative data, respondents for the quantitative phase were selected from among the administrators, faculty members, alumni, and students of the BTVTEd program at the university. Table 2 presents the distribution of respondents for this phase of the study. Of the total respondents, 79.7% were students, 14.8% were alumni, 3.9% were faculty members, and 1.6% were administrators. In terms of actual numbers, five administrators, 12 faculty members, 45 alumni, and 243 students voluntarily participated in the survey

## 3. Results and Discussions

### 3.1 Issues, Challenges, and Concerns are Encountered in the Current BTVTEd Curriculum

Table 1 illustrates the themes identified from participant interviews regarding the issues, challenges, and concerns related to the BTVTEd curriculum. Experts identified curriculum and program design as the most prevalent issues, challenges, and concerns encountered in the BTVTEd program. This result points out that there may be significant gaps in how BTVTEd curriculum was designed and implemented. The same findings were identified in the study of Rivera and Baptista (2024) were notable gaps identified in the absence of competencies as mandated in the TESDA competencies of computer system servicing.

Moreso, experts expressed concerns about faculty availability and qualifications, noting the significant impact these factors have on the effectiveness of the BTVTEd curriculum. The effectiveness and success of the BTVTEd program heavily depends on the qualifications and availability of faculty members. Often, instructors lack practical experience in their fields or have insufficient training in technical-vocational education pedagogy. According to Salvador et.al. (2022), the implication of this issue may lead to misdiagnosis of learners' needs, and providing the suitable performance or task to bridge the competency gaps. Thus, may result in poor performance of graduates in licensure examination and workplace.

Resources and facilities were also identified as critical challenges within the BTVTEd curriculum, as this can hinder students' acquisition of competencies required for the workplace. In the report of the World Bank as cited by Rivera and Baptista (2024) in their study, quality and availability of resources and facilities can highly affect

the effective implementation of any vocational and teacher education programs. Lastly, concerns about student preparedness and graduate outcomes were noted by participants, highlighting a need for improvements in these areas.

Lastly, concerns about student preparedness and graduate outcomes were noted by participants. This statement stresses that graduate's competence do not conform with the PQF standards of the Philippine Education System, and there is a challenge to integrate PQF and TESDA certifications in the BTVTEd curriculum. In the study of the Education Commission – Year 2 in 2024, the result also indicates inconsistent integration of K-12 and PQF policies across various programs in higher education.

Table 1 provides understanding on the key issues, challenges, and concerns encountered in the current BTVTEd curriculum, as perceived by various respondent groups. Among the four areas examined, Resources and Facilities emerged as the most significant challenge, receiving the highest weighted mean across all groups: This indicates a widespread consensus that the inadequacy of resources and facilities is the most pressing issue in the implementation of the BTVTEd curriculum. This finding is consistent with Mahasneh's (2014) qualitative study, which identified resource limitations as a major obstacle, attributing 64% of the problems to insufficient financial allocations. This is being viewed relatively in the study where insufficient funding, outdated equipment, and a lack of access to modern technologies can hinder the effective delivery of TVET programs (Ramos, 2021). This can create a suboptimal learning environment and limit students' exposure to current industry practices. Similarly, Rosina et al. (2021) emphasized that inadequate facilities and infrastructure hinder hands-on practice in industrial settings, creating a significant barrier to aligning school curricula with the evolving needs of the industrial sector.

**Table 1** *Generated themes on issues, challenges, and concerns encountered in the BTVTEd curriculum*

Themes	Frequency	Percentage	Rank
Curriculum and Program Design	14	93.3%	1
Resources and Facilities	12	80.0%	3
Faculty Availability & Qualifications	13	86.7%	2
Student Preparedness and Graduate Outcomes	5	33.3%	4

In contrast, Faculty Availability and Qualifications received the lowest weighted mean among the respondent groups. While still considered an issue, the lower ratings suggest that it is perceived as less critical than resource-related challenges. However, its importance should not be overlooked, as faculty members without relevant industry experience present a significant barrier to aligning the curriculum with industrial advancements (Rosina et al., 2021). This highlights the need for professional development programs and the recruitment of industry-experienced educators to bridge the gap between academic instruction and industry demands.

**Table 2** Weighted mean on issues, challenges, and concerns are encountered in the current BTVTEd curriculum as perceived by the respondents

Issues, challenges, and concerns encountered in the BTVTEd curriculum	Faculty Members			Administrators			Students			Alumni		
	WM	SD	VI	WM	SD	VI	WM	SD	VI	WM	SD	VI
A. Curriculum and Program Design	3.46	0.86	NAND	3.96	1.01	A	3.66	0.79	A	3.37	0.90	NAND
B. Resources and Facilities	4.51	0.74	SA	4.93	0.22	SA	4.14	0.86	A	3.89	1.08	A
C. Faculty Availability & Qualifications	3.15	1.15	NAND	3.67	0.78	A	3.50	0.86	A	3.37	1.24	NAND
D. Student Preparedness and Graduate Outcomes	3.15	1.06	NAND	3.67	1.01	A	3.50	0.97	A	3.37	1.20	NAND

**Legend:** WM – Weighted Mean; SD – Standard Deviation; VI – Verbal Interpretation

**Scale:** 1.00 - 1.49 (Strongly Disagree); 1.50 - 2.50 (Disagree); 2.51 - 3.49 (Neither agree nor disagree); 3.50 - 4.50 (Agree); 4.51 - 5.00 (Strongly agree)

### 3.2 Key Courses, Learning Areas, or Components to be Included in the BTVTEd Curriculum

Participants were interviewed to identify key courses, learning areas, or components that should be integrated into the BTVTEd curriculum. Table 3 summarizes the five themes that emerged from the qualitative data analysis. Notably, all participants concurred that the BTVTEd curriculum must include courses and learning areas focused on research, innovation, and sustainability. Participants emphasized the importance of incorporating subjects such as design thinking, educational entrepreneurship, industrial automation and robotics, and sustainability. Kilag et. Al. (2023), in their study suggested the integration of green skill and environmental education in the technical and vocational education curriculum can promote sustainable development. The participants also recognized the necessity for courses related to pedagogy, curriculum, and instructional design. This result was also suggested by Alinea (2021) in his study where it suggests incorporating comprehensive pedagogical and instructional design components in the curriculum of technical vocational teacher education programs.

Furthermore, courses pertaining to personal and professional development were deemed essential. According to participants, courses could encompass topics such as work ethics, soft skills development, and gender and development. Moreover, participants advocated for a strong emphasis on technical-vocational education and skills training within the curriculum. Lastly, participants suggested that courses related to regulatory standards and quality assurance should also be included in the BTVTEd curriculum. The result supports the analysis of Awodiji (2024) in his study on the relationship of soft skills and employability among TVET graduates. The study revealed that integrating soft skills training in the TVET programs can enhance graduate’s employability.

**Table 3** Generated themes on key courses, learning areas, or components should be included in the BTVTEd curriculum

Themes	Frequency	Percentage	Rank
Technical-Vocational Education and Skills Training	9	60%	4
Pedagogy, Curriculum, and Instructional Design	13	87%	2.5
Regulatory, and Quality Assurance	6	40%	5
Personal and Professional Development	11	73%	2.5
Research, Innovation, and Sustainability	15	100%	1

Table 4 presents the weighted mean of respondents' assessments regarding key courses, learning areas, and components that should be included in the BTVTEd curriculum. Technical-Vocational Education and Skills Training received the highest weighted mean across all respondent groups, all of which correspond to the verbal interpretation of "Very Important." This indicates a broad consensus on the centrality of technical-vocational training within the curriculum, highlighting its perceived importance in preparing students for the workforce.

Furthermore, Regulatory and Quality Assurance was also considered very important, particularly by alumni, who rated it equally significant as Technical-Vocational Education and Skills Training. This finding aligns with Cabrerros et. al (2024) proposed management framework for the quality assurance of technology and TVET Teacher Education programs. Cabrerros emphasized the importance of a structured, three-phase approach to developing competent trainers, with a focus on efficient resource management, adherence to standards, fostering a culture of quality, and aligning TVET programs with workforce needs and the National Qualification Framework. To ensure the ongoing relevance and effectiveness of the BTVTEd program, it is essential for universities to incorporate topics related to Regulatory and Quality Assurance. This will help students stay informed about international, national, and local standards governing the BTVTEd program, thereby aligning the curriculum with industry expectations and enhancing its overall quality. In contrast, Research and Innovation and Sustainability received lower weighted means across the respondent groups. Administrators marked Regulatory and Quality Assurance as the lowest priority area, though still rated as "Very Important." This indicates a more nuanced view, where Research and Innovation and Sustainability are still valued but not perceived as central compared to the other areas, such as Technical-Vocational Education and Skills Training and Regulatory and Quality Assurance.

**Table 4** Weighted mean on key courses/learning areas/components included in the BTVTEd curriculum

Key courses/learning areas/components should be included in the BTVTEd curriculum	Faculty Members			Administrators			Students			Alumni		
	WM	SD	VI	WM	SD	VI	WM	SD	VI	WM	SD	VI
A. Technical-Vocational Education and Skills Training	4.91	0.28	VI	4.93	0.14	VI	4.61	0.58	VI	4.72	0.46	VI
B. Pedagogy, Curriculum, and Instructional Design	4.86	0.29	VI	4.60	0.48	VI	4.51	0.61	I	4.63	0.49	VI
C. Regulatory, and Quality Assurance	4.77	0.35	VI	4.58	0.53	VI	4.49	0.67	I	4.72	0.42	VI
D. Personal and Professional Development	4.78	0.36	VI	4.64	0.30	VI	4.57	0.62	VI	4.65	0.50	VI
E. Research, Innovation, and Sustainability	4.73	0.41	VI	4.60	0.33	VI	4.36	0.64	I	4.47	0.57	I

**Legend:** WM – Weighted Mean; SD – Standard Deviation; VI – Verbal Interpretation

**Scale:** 1.00 - 1.49 (Not Important); 1.50 - 2.50 (Slightly Important); 2.51 - 3.49 (Moderately Important); 3.50 - 4.50 (Important); 4.51 - 5.00 (Very Important)

### 3.3 Practices Employed to Enhance the BTVTEd Curriculum

Four themes emerged from the analysis of practices used by participants to enhance the BTVTEd curriculum as presented in Table 5. The most frequently cited practice as mentioned by the participants was curriculum updating and alignment with established standards, a strategy widely implemented across universities offering the BTVTEd program. This emphasized that conducting regular curriculum reviews ensures that the BTVTEd curriculum becomes comprehensive, relevant, and capable of producing highly competent, innovative, and adaptable graduates, and respond to the needs of society and to conform to the current knowledge economy that emphasize technical know-how (Auta, 2022).

Another prominent practice identified was stakeholder and industry engagement to ensure the curriculum remains relevant to industry demands. Further, participants recommend extending the number of hours of Supervised Industry Training to at least 480 hours to enhance students' practical experience. While there is no existing studies that explicitly reports the recommendation of additional hours for SIT, Generalao et. al (2024), supports the integration of substantial industry-based training in TVET programs.

Additionally, participants also emphasized the importance of teaching and faculty development as a key practice for curriculum enhancement. In the interview, one participant highlighted that the department or college requires instructors teaching specialized courses to obtain National Certificates, Trainers Methodology, and

pursue further studies. Through CHED Memorandum Order (CMO) 79, series of 2017, it underscores the significance of requiring faculty members to possess relevant national certifications and advanced degrees to ensure the delivery of quality education aligned with the Philippine Qualifications Framework and industry needs. This approach is expected to produce more competent students, and scholarships are also available to support faculty development. (CHED, 2017).

Finally, participants also stressed the significance of performance tracking and assessment for both students and faculty to support continuous improvement in the BTVTEd curriculum. In the study of Baling Bing and Baluyong (2025), on the factors contributing to the success of BTVTEd graduates in the licensure examination for teachers, it revealed that aligning the curriculum with LET competencies and tracking graduate performance are essential for continuous quality improvement. This strategic approach enables the identification of areas that require improvement in the curriculum, as well as highlighting its strengths and best practices.

**Table 5** *Generated themes on practices employed to enhance the BTVTEd curriculum*

Themes	Frequency	Percentage	Rank
Curriculum Updating and Alignment with Standards	12	80.0%	1
Performance Tracking and Assessment of both Students and Faculty Members	6	40.0%	4
Stakeholder and Industry Engagement	8	53.3%	2
Teaching and Faculty Development and Support	7	46.7%	3

Table 6 presents the responses from respondents regarding practices to enhance the BTVTEd curriculum. Teaching and Faculty Development and Support received the highest weighted means from respondents, all of which were interpreted as "Highly Practiced." This underscores the widespread recognition of the importance of continuous faculty development and support as a key practice in enhancing the BTVTEd curriculum. As emphasized by Sakhrekar & Sayankar (2023), faculty development is an essential element of institutional excellence. The knowledge, professional expertise, and industry insights of faculty members are shaped by their exposure, developmental experiences, self-directed learning, and other factors, all of which contribute to the quality of teaching and curriculum delivery. Rosina et al. (2021) concluded that the alignment of the curriculum with advancements in information technology and the needs of the industrial sector can be achieved through the provision of adequate facilities and infrastructure, sufficient funding to support hands-on industry practice, and the presence of educators with direct industry experience.

In addition, Stakeholder and Industry Engagement was rated highest by Alumni respondents, indicating the value they place on active collaboration with external stakeholders and industry partners. This finding suggests that alumni view industry engagement as a critical practice for ensuring the relevance and effectiveness of the curriculum in addressing workforce needs. As noted by Saryadi et al. (2024), one significant advantage of stakeholder and industry engagement is that industry partners can not only collaborate with Vocational Higher Schools but also provide facilities, resources, and practical guidance to students during their studies. These insights underscore the value of both internal faculty development and external industry partnerships in improving the quality and impact of the BTVTEd program.

On the other hand, Performance Tracking and Assessment received the lowest weighted mean across the respondent groups. This suggests that while faculty and alumni value performance tracking, students perceive it as less consistently implemented or effective in their experience. The International Labour Organization (2016) supports the importance of performance tracking, recommending the implementation of quality monitoring and evaluation mechanisms that track graduates' progress in the labour market and allow employers to anonymously provide feedback on TVET institutions' performance. Further Yusop et. al. (2022) highlighted that "Assessment in education not only examines students' abilities on the elements to be accomplished, but it also evaluates instructors' teaching approaches." Moreover, Alinea (2021) emphasizes the need for "continuous tracking of graduates at least every five years to monitor their acquired skills and professional advancements in their respective fields, which could inform curriculum development." This underscores the importance of regularly reviewing and updating the technical vocational teacher education curriculum to align with the evolving demands of both industry and the educational sector. Furthermore, Stakeholder and Industry Engagement received the lowest rating from Administrators indicating that it may not be as actively or widely prioritized compared to other practices. This highlights an opportunity to strengthen engagement with external stakeholders and better align the curriculum with industry demands.

**Table 6** *Weighted mean on practices employed to enhance the BTVTED curriculum*

Practices employed to enhance the BTVTED curriculum	Faculty Members			Administrators			Students			Alumni		
	WM	SD	VI	WM	SD	VI	WM	SD	VI	WM	SD	VI
A. Curriculum Updating and Alignment with Standards	4.10	0.69	HP	3.89	0.91	HP	3.62	1.02	HP	3.90	1.13	HP
B. Performance Tracking and Assessment of both Students and Faculty Members	3.69	1.11	HP	4.11	0.87	HP	3.48	1.13	MP	3.76	1.06	HP
C. Stakeholder and Industry Engagement	4.08	0.98	HP	3.74	1.20	HP	3.59	1.09	HP	4.02	1.05	HP
D. Teaching and Faculty Development and Support	4.33	0.81	HP	4.44	0.73	HP	3.86	0.97	HP	3.95	1.13	HP

**Legend:** WM – Weighted Mean; SD – Standard Deviation; VI – Verbal Interpretation

**Scale:** 1.00 - 1.49 (Not Practiced); 1.50 - 2.50 (Slightly Practiced); 2.51 - 3.49 (Moderately Practiced); 3.50 - 4.50 (Highly Practiced); 4.51 - 5.00 (Very Highly Practiced)

### 3.4 Factors Contributing to the Improvement of the BTVTED Curriculum

Table 7 presents three key themes related to factors that contribute to improvements in the BTVTED curriculum. The first theme emphasizes curriculum relevance and industry alignment, which underscores the need for the curriculum to reflect current industry standards and adapt to evolving job market demands. Moreso, with an education that is outcome-based and curriculum that is align with the labor market demands, TVET programs can ensure to produce quality and employable graduates (Woyessa, & Arko-Achemfuor, 2021).

The second theme focuses on faculty and instructional quality, identified as a crucial factor by several participants. Participants argued that faculty expertise significantly impacts the quality of students produced by the university. (Olvido, et. al, 2024). This result underscore the need for comprehensive training programs to enhance faculty competencies, thereby improving the instructional quality in BTVTED curriculum (Villanueva, J.E., 2018; Maloniso, M. O., & Naelgas, D. N., 2022)

Lastly, participants believed that infrastructure and support systems, such as administrative support, play an important role in enhancing the BTVTED curriculum. Infrastructure and support systems are considered the basic requirements of skill-based programs, and must therefore be given enough funds to deliver quality instructions for learners. In the research assessment conducted by Lee (2024) on the readiness of TVET institutions and their industry partners to adopt in the fourth industrial revolution (4IR) in the Philippines, many TVET institutions exhibit only a moderate level of readiness in infrastructure. These results, display low regard on the basic needs of delivering technical and vocational education in the country.

**Table 7** *Generated themes on factors contributing to the improvement of the BTVTED curriculum*

Themes	Frequency	Percentage	Rank
Faculty and Instructional Quality	10	66.7%	2
Curriculum Relevance and Industry Alignment	11	73.3%	1
Infrastructure and Support Systems	6	40.0%	3

Table 8 demonstrates the result of a quantitative survey, Faculty and Instructional Quality and Infrastructure and Support Systems emerged as the most significant contributors. The findings align with Gryson et al. (2024), who underscored the critical role of administrative support, particularly guidance from school principals, in successful program implementation. Additionally, Saryadi et al. (2024) highlighted the importance of government backing and industry partnerships in ensuring the effective delivery of industrial training programs, further emphasizing the need for robust support systems.

Similarly, Faculty and Instructional Quality was rated as an Extremely Influential factor by Administrators and as Very Influential by Students and Alumni. This concurs with the findings of Arinaitwe (2021) that organizing workshops and symposiums are necessary to equip and orient faculty members on the methods and practices of the industry.

In contrast, Curriculum Relevance and Industry Alignment received comparatively lower weighted means from Administrators, Students, and Alumni. While this factor was rated lower, it remains Very Influential in improving the BTVTED curriculum. Sofyawati et. al. (2022) underscores that though curriculum design and implementation and role of management and leaders in the curriculum development heeded to the needs of the workplace, however, if collaborations has not fostered between the academe and the industry, there will still be a

missing link in the curriculum. This factor is being highlighted due to the rapid pace of technological change which requires constant curriculum revision and updating. Also, the lack of pragmatic policies in improving the quality of TVET Teacher Education Program (Yunos et al., 2016).

**Table 8** Weighted means on factors contributing to the improvement of the BTVTEd curriculum

Factors contributing to enhance the BTVTEd curriculum	Faculty Members			Administrators			Students			Alumni		
	WM	SD	VI	WM	SD	VI	WM	SD	VI	WM	SD	VI
A. Faculty and Instructional Quality	4.62	0.62	EI	4.78	0.37	EI	4.35	0.70	EI	4.47	0.65	EI
B. Curriculum Relevance and Industry Alignment	4.64	0.62	EI	4.48	0.71	EI	4.26	0.73	EI	4.39	0.67	EI
C. Infrastructure and Support Systems	4.74	0.60	EI	4.78	0.29	EI	4.29	0.75	EI	4.47	0.65	EI

**Legend:** WM – Weighted Mean; SD – Standard Deviation; VI – Verbal Interpretation  
**Scale:** 1.00 - 1.49 (Not at all influential); 1.50 - 2.50 (Slightly influential); 2.51 - 3.49 (Moderately Practice Somewhat influential); 3.50 - 4.50 (Very influential); 4.51 - 5.00 (Extremely influential)

### 3.5 Strategies Utilized to Enhance the BTVTEd Curriculum

As presented in Table 9, four key themes emerged from participants' responses regarding strategies to enhance the BTVTEd curriculum. The most frequently cited strategy by the participants was Curriculum Development and Review, highlighting its critical role in ensuring alignment with current educational and industry standards. Daenos et.al (2023) suggested a six-step approach for curriculum enhancement which includes problem assessment, needs assessment of targeted learners, goals and objectives, educational strategies, implementation and feedback. This approach was used to enhance the curriculum of BTVTEd, and may also be utilized by other institutions for curriculum development and review. Additionally, three other strategies—Industry Collaboration and Linkages, Faculty Development and Training, and Innovative Teaching Methods were equally mentioned by participants. This indicates an equal emphasis on these approaches as vital components of curriculum enhancement. Notably, the themes generated from strategies closely align with those identified for practices aimed at improving the BTVTEd curriculum. This alignment suggests consistency in participants' views, indicating a coherent understanding of both strategic planning (strategies) and practical implementation (practices) in driving curriculum improvement. Alinea (2021) also recommends the same strategy of synchronizing the expectation and demands of both academe and industry, which also suggests modifications or revisions of the BTVTEd curriculum.

**Table 9** Generated themes on the strategies utilized in enhancing BTVTEd curriculum

Themes	Frequency	Percentage	Rank
Curriculum Development and Review	8	53.3%	1
Industry Collaboration and Linkages	5	33.3%	3
Faculty Development and Training	5	33.3%	3
Innovative Teaching and Learning Strategies	5	33.3%	3

Table 13 presents the weighted means of respondents' assessments on strategies to enhance the BTVTEd curriculum. Faculty Members identified three strategies as Very Important: Curriculum Development and Review, Industry Collaboration and Linkages, and Innovative Teaching and Learning, each with a weighted mean of 4.92. Similarly, Administrators rated Curriculum Development and Review as Very Important, assigning it the highest weighted mean of 4.96. Students emphasized Industry Collaboration and Linkages with a weighted mean of 4.54 as a Very Important strategy for curriculum enhancement, reflecting their recognition of the value of real-world industry connections. Meanwhile, Alumni prioritized Faculty Development and Training with a weighted mean of 4.73 as the most crucial strategy, highlighting its importance in improving instructional quality and aligning the curriculum with industry needs. The varying perspectives among respondent groups underscore the collective significance of all these strategies. This demonstrates that no single approach should be overlooked, as each plays a complementary role in enhancing the BTVTEd curriculum.

**Table 10** Weighted mean on strategies to enhance the BTVTEd curriculum

Strategies to enhance Curriculum	Faculty Members			Administrators			Students			Alumni		
	WM	SD	VI	WM	SD	VI	WM	SD	VI	WM	SD	VI
A. Curriculum Development and Review	4.92	0.28	VI	4.96	0.11	VI	4.53	0.64	VI	4.64	0.57	VI
B. Industry Collaboration and Linkages	4.92	0.28	VI	4.81	0.38	VI	4.54	0.63	VI	4.70	0.47	VI
C. Faculty Development and Training	4.85	0.32	VI	4.81	0.29	VI	4.49	0.65	I	4.73	0.47	VI
D. Innovative Teaching and Learning Strategies	4.92	0.28	VI	4.85	0.24	VI	4.43	0.72	I	4.70	0.49	VI

**Legend:** WM – Weighted Mean; SD – Standard Deviation; VI – Verbal Interpretation

**Scale:** 1.00 - 1.49 (Not Important); 1.50 - 2.50 (Slightly Important); 2.51 - 3.49 (Moderately Important); 3.50 - 4.50 (Important); 4.51 - 5.00 (Very Important)

### 3.6 Comparison of Respondents' View on BTVTEd Curriculum Challenges and Improvements

Table 11 to 13 presents the ANOVA results for the three key areas examined in the study: a) Issues, challenges, and concerns in the BTVTEd curriculum; b) Key courses, learning areas, or components that should be included in the BTVTEd curriculum; and c) Factors contributing to curriculum improvement.

#### 3.6.1 Comparison of Respondents' Assessment of Issues, Challenges and Concerns

Table 11 highlights significant issues and challenges encountered in the BTVTEd curriculum. Specifically, Resources and Facilities ( $F = 4.396$ ,  $p = .005$ ) and Faculty Availability and Qualifications ( $F = 5.988$ ,  $p = .001$ ) were identified to be "significant". Post hoc analysis revealed notable differences in the assessments among administrators, students, and alumni in these areas. Each group finds the issues, challenges, concerns show degree of impact and relevance due to the nature of their demographic characteristics as stakeholders. Conversely, Curriculum and Program Design ( $F = 2.268$ ,  $p = .081$ ) and Student Preparedness and Graduate Outcomes ( $F = 0.778$ ,  $p = .507$ ) were interpreted to be "not significant", indicating consensus among respondents regarding the presence of these issues within the university's BTVTEd curriculum. Interestingly, despite statistical significance, respondents agreed that Curriculum and Program Design together with Student Preparedness and Graduate Outcomes may be viewed equally satisfactorily and as important issues.

**Table 11** Comparison of the respondents assessments on the issues, challenges, and concerns encountered in the BTVTEd curriculum

Issues, challenges, and concerns encountered in the BTVTEd curriculum	WM				F value	P value	VI
	Faculty Members	Administrators	Students	Alumni			
A. Curriculum and Program Design	3.46	3.96	3.66	3.37	2.27	0.08	Not Significant
B. Resources and Facilities	4.51	4.93	4.15	3.89	4.40	0.01	Significant
C. Faculty Availability & Qualifications	3.28	4.22	3.61	3.08	5.99	0.00	Significant
D. Student Preparedness and Graduate Outcomes	3.15	3.67	3.50	3.37	0.78	0.51	Not Significant

**Legend:** WM – Weighted Mean; P value  $\leq 0.05$ ; VI – Verbal Interpretation

### 3.6.2 Comparison of Respondents' Assessment of Key Course, Learning Areas, or Components

Table 12 presents the key courses, learning areas, and components that should be incorporated into the BTVTEd curriculum. The analysis reveals no significant differences across several areas, including Technical-Vocational Education and Skills Training ( $F = 2.501, p = .059$ ), Pedagogy, Curriculum, and Instructional Design ( $F = 1.970, p = .118$ ), Regulatory and Quality Assurance ( $F = 2.390, p = .069$ ), Personal and Professional Development ( $F = 0.719, p = .541$ ), and Research, Innovation, and Sustainability ( $F = 1.978, p = .117$ ). These results suggest that despite being not statistically significant, the shown high group mean, and consensus imply that all these areas should be consistently integrated into the BTVTEd curriculum.

Notably, Technical-Vocational Education and Skills Training received the highest rating, emphasizing its fundamental importance. This highlights the need for further emphasis and enhancement of this component within the curriculum to better address the evolving demands of technical-vocational education. Strengthening this area is essential for enhancing students' practical competencies, ensuring they are well-equipped to meet industry needs and contribute effectively to the workforce. By providing graduates with higher competencies in the key areas will likely provide students with satisfaction in their school life, and later with their jobs (Park & Yu, 2023). By doing so, graduates with higher achievement in vocational courses were satisfied with their school life.

**Table 12** Comparison of the respondents' assessments on key courses/learning areas/components should be included in the BTVTEd curriculum

Key courses/learning areas/components should be included in the BTVTEd curriculum	WM				F value	P value	VI
	Faculty Member	Administrators	Students	Alumni			
A. Technical-Vocational Education and Skills Training	4.91	4.93	4.61	4.72	2.50	0.06	Not Significant
B. Pedagogy, Curriculum, and Instructional Design	4.86	4.61	4.51	4.63	1.97	0.12	Not Significant
C. Regulatory, and Quality Assurance	4.77	4.58	4.49	4.72	2.39	0.07	Not Significant
D. Personal and Professional Development	4.79	4.64	4.57	4.65	0.72	0.54	Not Significant
E. Research, Innovation, and Sustainability	4.73	4.60	4.37	4.47	1.98	0.12	Not Significant

**Legend:** WM – Weighted Mean; P value  $\leq 0.05$ ; VI – Verbal Interpretation

### 3.6.3 Comparison of Respondents' Assessments of Factors Enhancing the BTVTEd Curriculum

Table 13 presents the respondents' perceptions of the factors influencing the enhancement of the BTVTEd curriculum. The analysis indicates a significant difference in perceptions regarding Infrastructure and Support Systems ( $F = 3.322, p = .020$ ). Interestingly, this finding suggests that respondents considered Infrastructure and Support Systems as a crucial factor in curriculum enhancement. This observation aligns with the earlier findings presented in Table 9.1, reinforcing a consistent perspective among respondents.

Contrariwise, no significant differences were observed in the respondents' perceptions of Faculty and Instructional Quality ( $F = 1.939, p = .123$ ), and Curriculum Relevance and Industry Alignment ( $F = 1.636, p = .181$ ). These results imply that both factors are widely acknowledged as critical contributors to improving the BTVTEd curriculum. The consistent emphasis on faculty quality and industry alignment highlights their perceived importance in ensuring a curriculum that meets educational and industry standards (Alinea, J. M. L., 2021; Rivera, J., & Baptista, V. E. G., 2024).

**Table 13** Comparison of the respondents' assessments on factors contributing to enhance the BTVTEd curriculum

Factors contributing to enhance the BTVTEd curriculum	WM				F value	P value	VI
	Faculty Member	Administrators	Students	Alumni			
A. Faculty and Instructional Quality	4.62	4.78	4.35	4.47	1.94	0.12	Not Significant
B. Curriculum Relevance and Industry Alignment	4.64	4.48	4.26	4.39	1.64	0.18	Not Significant
C. Infrastructure and Support Systems	4.74	4.78	4.29	4.47	3.32	0.02	Significant

**Legend:** WM – Weighted Mean; P value  $\leq 0.05$ ; VI – Verbal Interpretation

### 3.6.4 Proposed Curriculum Model for RTU Undergraduate Technical-vocational Teacher Education

A curriculum model for undergraduate technical vocational teacher education specifically its offshoot program, Bachelor of Technical-Vocational Teacher Education (BTVTEd) is a learning framework designed to enhance the acquisition and articulation of necessary technical vocational teacher education competencies in general through relevant and essential learning areas or courses and to provide directions for strengthening and innovating the existing program and policy mechanisms for its implementation. The developed model as contemporary resolve to varying issues and societal requirements includes addressing emerging collaborating disciplines like Artificial Intelligence, Sustainability, and Innovation. Unlike its similar predecessor models which have parallel content areas focus on other significant concerns like gender responsiveness in A gender and industry-responsive curriculum model for technical-vocational teacher education program by Alinea & Reyes, (2023), industry generated demand standards in Competency-Based Curriculum Model for Technical Vocational Education and Training (TVET) in Nigeria by Usoro and Ezekiel, (n.d.), and collaboration with industries in curriculum development, especially in the learning process in The Developed Vocational Education Program and The World Of Work: Establishing Link And Match by Sofyawati et al., (2022). The present model is comparable with the similar major contents and learning areas common to other similar models as these are continuously updated through integrating information from the results of research conducted and feedback gathered from the stakeholders. However, the study is limited only to the exploration of factors toward development of a new model which integrates existing strengths and weaknesses of the present curriculum. It will proceed to the next phase of research which is the pilot implementation and evaluation.

Furthermore with limited availability of variety of contemporary learning frameworks for modeling a technical vocational teacher education curriculum, the output model was heavily reliant to the key findings of the study and considered the model of developing standards of vocational teacher at bachelor level by Soysouvanh et al. (2013) which was based on the identified five competency areas of standards for vocational teachers at the Bachelor level namely, 1) Competency Area of Acting in an exemplary manner, 2) Competency Area of Education, 3) Competency Area of Teaching, 4) Competency Area of Assessment, and 5) Competency Area of Sell-Development and Innovation. The identified variables such as issues, challenges and concerns served as the bases for initial recalibration and to check on the current curriculum implementation. The identified strengths and weaknesses of the existing curriculum were addressed in the model. Key learning areas were determined to be added and fortify technical vocational courses and upgrade allied courses toward holistic development and preparation of an innovative technical vocational teacher education graduate.

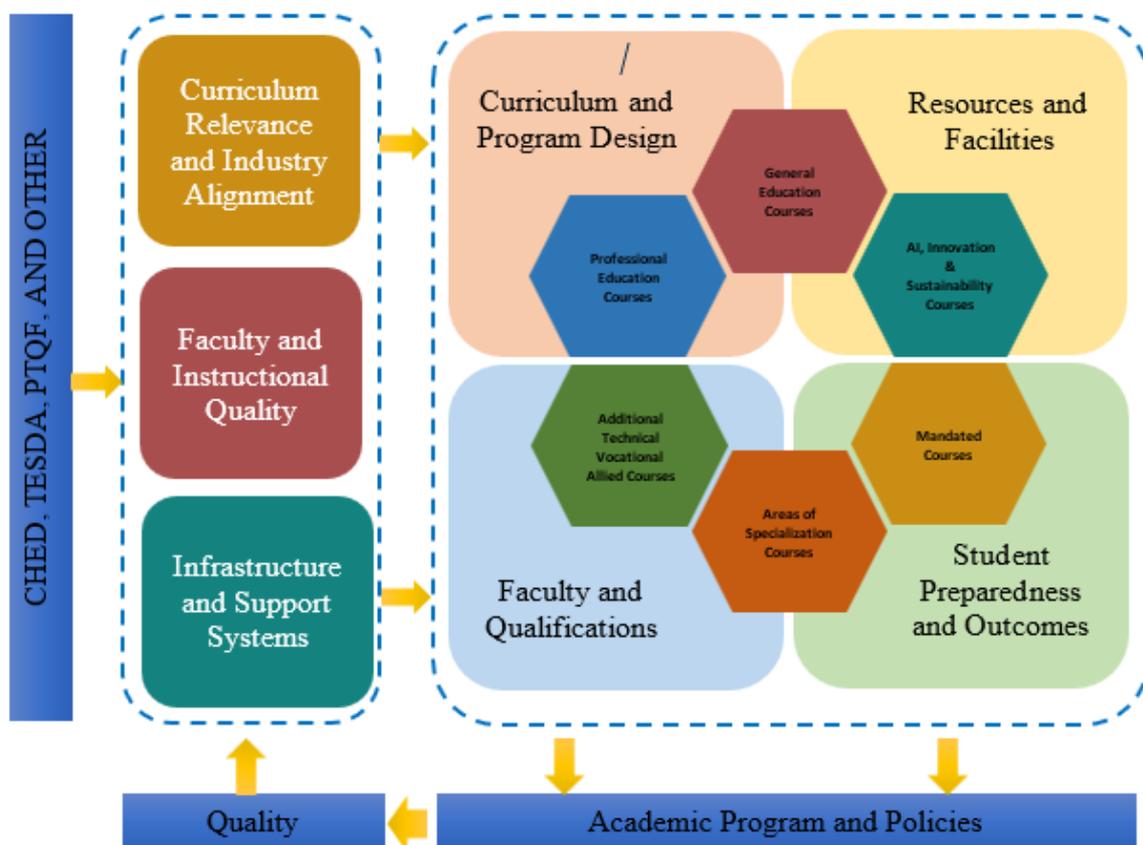
In addition, key practices, factors, and strategies identified that may enhance and ensure technical vocational teacher education curriculum is capable of addressing various demands from the industry and institutions both locally and globally were incorporated. As shown in the summary matrix in the table below, issues, challenges, and concerns identified by the expert participants and respondents were deemed grounds for the trajectory of the curriculum content which are necessary to also lay foundations for potential innovations in the academic program and policies to be implemented based on the new curriculum content and model. Subsequently, in order to provide a systematic platform to structure the new model of technical vocational teacher education curriculum it will be further and contextually designed according to the statutory and technical vocational requirements of both international and local qualification standards including the institutional culture.

Just like any other critically and carefully developed curriculum model, the newer model may post challenges on its implementation. The implementation of the new BTVTEd curriculum faces several challenges that require proactive strategies to ensure relevance, quality, and sustainability. One significant challenge is the remaining

potential mismatch between specific course content and industry demands, driven by rapid advancements in technology and continuously evolving labor market needs. To address this, institutions must foster strong partnerships with industry stakeholders to co-develop and regularly review specific course contents. Establishing cooperative education advisory boards and incorporating flexible, updatable immersive pedagogies can help align learning outcomes with current trends and skills requirements. Likewise, inadequate facilities and outdated equipment pose logistical and financial barriers, as TVET programs heavily rely on access to practical tools and modern laboratories. Addressing this challenge involves exploring public-private partnerships, applying for government or international grants, and integrating digital solutions such as virtual simulations to supplement hands-on training.

**Table 14** Matrix of bases for the development of curriculum model for technical vocational teacher education vis-a-vis innovation of program and policy

Issues, Challenges, and Concerns	Practices, Factors, and Strategies in Enhancing the Curriculum		
	Curriculum	Program	Policy
Curriculum and Program Design	1. Technical-Vocational Education and Skills Training	Curriculum Development and Review	Curriculum Updating and Alignment with Standards
Resources and Facilities	2. Pedagogy, Curriculum, and Instructional Design	Industry Collaboration and Linkages	Stakeholder and Industry Engagement
Faculty Availability & Qualifications	3. Regulatory, and Quality Assurance	Faculty Development and Training	Teaching and Faculty Development and Support
Student Preparedness and Graduate Outcomes	4. Personal and Professional Development	Innovative Teaching & Learning Strategies	Performance Tracking & Assessment of - Students and Faculty Members
	5. Research, Innovation, and Sustainability		



**Fig. 1** Curriculum model components for technical vocational teacher education

#### 4. Conclusions

The study aimed to examine and assess the extent of knowledge, experiences and practices in the BTVTED curriculum of selected universities in the Philippines. The analysis revealed that primary issues, challenges, and concerns encountered in the BTVTED curriculum include the curriculum and program design, faculty availability and qualifications, resources and facilities, and students' preparedness and graduate outcomes. Interview results highlighted the primary challenges rooted in the curriculum and program design itself, however survey responses suggest different trends. Respondents viewed resources and facilities as the central issue encountered in the BTVTED curriculum. The findings across studies underscores the critical impact of resource deficiencies on program delivery and educational quality. These results highlight the urgent need for increased investment in the resources and facilities of the BTVTED program to enhance its relevance and effectiveness.

Interestingly, qualitative results revealed that courses pertaining to research, innovation, and sustainability must be emphasized on the curriculum. Quantitative results, on the other hand, lean on the emphasis of Technical-Vocational Education and Skills Training. These findings suggest that while there is widespread support for integrating research, innovation, and sustainability into the BTVTEd curriculum, they may not be prioritized to the same extent as Technical-Vocational Education and Skills Training, which are considered crucial for aligning the curriculum with industry needs.

Qualitative interviews on the practices to enhance the BTVTEd curriculum highlighted Curriculum Updating and Alignment with Standards as the prominent practice to enhance the BTVTEd curriculum, Teaching and Faculty Development and Support emerged to be the best practice as the result of the quantitative survey. Further, both phases converged on Performance Tracking and Assessment of both Students and Faculty Members as the least practice in enhancing the curriculum. The need for balanced practice among the areas of Curriculum Updating and Alignment with Standards, Performance Tracking and Assessment of both Students and Faculty Members, Stakeholder and Industry Engagement, and Teaching and Faculty Development and Support must be observed in the enhancement of the BTVTEd curriculum.

On the factors contributing to improving the BTVTEd curriculum quantitative phase of the study identified Curriculum Relevance and Industry Alignment as the main factor to drive BTVTEd curriculum improvement. Hence, as revealed in the quantitative phase, Infrastructure and Support Systems along with Faculty and Instructional Quality were the key factors that lead BTVTEd curriculum enhancement. This suggests that although curriculum alignment with industry needs is recognized as important, other factors such as infrastructure and instructional quality are perceived as more immediate priorities in driving curriculum enhancement.

Both phases concurred on Curriculum Development and Review as the best strategy to enhance the curriculum. Further convergences were identified since both phases underscore equal significance on Industry Collaboration and Linkages, Faculty Development and Training, and Innovative Teaching and Learning Strategies. The results suggest a holistic approach that integrates all these strategies to achieve comprehensive curriculum improvement.

Using inferential statistics, significant differences were recognized on the assessments of the respondents on the issues, challenges and concerns pertaining to Resources and Facilities, and Faculty Availability & Qualifications. In addition, no significant differences were discovered on the key courses/learning areas/components that should be included in the BTVTEd curriculum. This suggests that the inclusion of the identified courses/learning areas/components on Technical-Vocational Education and Skills Training, Pedagogy, Curriculum, and Instructional Design, Regulatory, and Quality Assurance, Personal and Professional Development, and Research, Innovation, and Sustainability must be reflected on the new curriculum of the BTVTEd. This further implies that the curriculum must be upgraded, integrate emerging concepts and include current issues in various program innovation initiatives not only in the national scale but on an international level as well. that offer TVET teacher education programs specifically like the Philippines. As the curriculum continuously updates, it informs the academic program itself and policies to become better which in effect reshapes quality assurance mechanisms. Lastly, a significant difference was determined by the respondents on Infrastructure and Support System as the factors contributing to enhancing the BTVTEd curriculum. These findings underscore the need to prioritize faculty development and curriculum alignment with industry demands, while reevaluating the role of infrastructure and support systems in the broader context of curriculum enhancement. While scarcities in high calibre teaching workforce, advanced infrastructure, facilities and resources are remaining persistent challenges of most developing countries, it is indeed a priority concern for a more robust program and policy development.

## 5. Recommendations

Based on the findings of this exploratory sequential mixed methods study, the following recommendations are proposed:

1. The key courses, learning areas, or components to be included in BTVTEd curriculum may be explored to come up with consensus key courses of the BTVTEd curriculum. Policy makers, administrators and curriculum developers should investigate these areas as it may pave the way for revolutionizing the content of BTVTEd curriculum, aligning it with needs of both the academy and the industry.
2. Practices employed by participants in the qualitative phase may be an opportunity to investigate how universities offering BTVTEd balanced the use of these practices and strategies on the conduct of Quality Assurance. Policy makers, administrators and curriculum developers may also align quality assurance with best practices among similar institutions offering the same program.
3. The quantitative phase of the study was only conducted in a single university setting; future research may examine whether these findings are consistent across the different educational institutions offering BTVTEd curriculum.
4. The institution may utilize the developed curriculum model to guide the department in development and improvement of the BTVTEd curriculum. Other institutions offering BTVTEd program may also explore the curriculum to contextualize it in their respective departments.
5. The findings through the developed curriculum may also use by the policy makers and administrators as basis to lead the trajectory of the existing academic program and policies innovation to enhance its implementation including, but not limited to, the period and frequency of curriculum review and enhancement, requirements for the Supervised Industry Training, and protocol for Research Development

## Acknowledgement

The authors would like to express their sincerest gratitude to all the expert participants of various universities who took part in the qualitative phase, and to the respondents of the quantitative phase of the study. Moreover, the authors also extend their heartfelt gratitude for the support given by the Rizal Technological University, and the panel of examiners for their valuable suggestions on the improvement of the research.

## Conflict of Interest

Authors declare no conflict of interest on the publication of this paper.

## Author Contribution

*The authors confirm contribution to the paper as follows: **Research conceptualization:** Nilmar I. Moreno; **Research methodology:** Nilmar I. Moreno, Romelyn Z. Callueng; **Data gathering and investigation:** Nilmar I. Moreno, Romelyn Z. Callueng; **Data visualization and analysis:** Romelyn Z. Callueng, Nilmar I. Moreno; **Writing preparation:** Romelyn Z. Callueng; **Writing review and editing:** Nilmar I. Moreno, Romelyn Z. Callueng, Apollo P. Portez; **Research administration and supervision:** Nilmar I. Moreno, Romelyn Z. Callueng. All authors reviewed the results and approved the final version of the manuscript.*

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