

Strategies of Teachers in Teaching TVL Specialized Subjects during Pandemic at Bondoc Peninsula, Schools Division of Quezon

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Abstract

This study examined the instructional strategies employed by Technical-Vocational-Livelihood (TVL) teachers in teaching specialized subjects during the COVID-19 pandemic in the Bondoc Peninsula, Schools Division of Quezon, Philippines. Anchored on concepts of learning readiness, motivation, and adaptive instructional practices, the study employed a quantitative descriptive-survey research design involving 91 Senior High School TVL teachers selected through purposive sampling. Data were collected using a validated researcher-developed questionnaire administered through Google Forms and analyzed using frequency counts, percentages, means, rankings, and the Kruskal–Wallis H test. Findings revealed that teachers frequently employed improved instructional communication ($M = 3.76$), better technology integration ($M = 3.87$), and meaningful and inclusive participation strategies ($M = 4.16$), with the latter emerging as the most frequently practiced. No significant differences in instructional strategies were observed according to age, sex, or length of teaching service. However, meaningful and inclusive participation strategies differed significantly according to educational attainment ($p = 0.025$) and TESDA specialized certification ($p = 0.028$). The major challenges included excessive administrative workload, insufficient internet connectivity, and limited instructional materials and equipment. Consequently, policy guidelines were developed to strengthen instructional preparedness, professional development, resource accessibility, and learning continuity during educational disruptions. The study primarily supports Sustainable Development Goal 4 (Quality Education) and indirectly contributes to SDG 8 (Decent Work and Economic Growth) by promoting accessible vocational education and continued competency development. Its sustainability implications emphasize strengthening educational, technological, and institutional resilience through inclusive instructional practices and responsive learning continuity policies.

Keywords: Competency-Based Instruction; Educational Resilience; Inclusive Participation; Instructional Communication; Learning Continuity; Technology Integration

1. Introduction

The COVID-19 pandemic significantly disrupted educational delivery, requiring teachers to adopt alternative instructional strategies to sustain learning despite restrictions on face-to-face instruction. These disruptions were particularly challenging in Technical-Vocational-Livelihood (TVL) education, where competency development depends on practical demonstrations, hands-on activities, specialized equipment, and performance-based assessment. Recent studies have emphasized the importance of instructional adaptability, appropriate technology

integration, learner participation, and institutional support in sustaining vocational education during emergencies (Masrom et al., 2022; Jing et al., 2023). Within this context, the present study examines the strategies employed by TVL teachers in the Bondoc Peninsula, Schools Division of Quezon, during the pandemic, focusing on instructional communication, technology integration, meaningful and inclusive participation, and the challenges encountered in delivering specialized subjects. The investigation seeks to provide evidence for developing context-responsive policy guidelines that can strengthen instructional continuity during future pandemics, natural calamities, and other educational disruptions.

The COVID-19 pandemic compelled educational institutions worldwide to reconsider conventional teaching practices and introduce alternative learning delivery modalities. The transition from classroom-based instruction to remote and flexible learning exposed inequalities in technological access, instructional resources, teacher preparedness, and learner support. Ancheta and Ancheta (2022) emphasized that the sudden adoption of synchronous and asynchronous learning required significant instructional adjustments despite limited institutional preparedness. Similarly, UNESCO (2023) reported that educational technology can support learning continuity but that its effectiveness depends on equitable access, pedagogical appropriateness, and sufficient teacher preparation. In the Philippines, the disruption prompted the implementation of distance and flexible learning arrangements, including printed modules, digital platforms, and other alternative instructional approaches. Subsequently, the Department of Education (2022) adopted the Basic Education Development Plan 2030, emphasizing educational access, equity, quality, resilience, and recovery from pandemic-related disruptions. However, the effectiveness of alternative learning arrangements remained dependent on teachers' capacity to develop appropriate instructional materials, maintain communication, and respond to learners' circumstances. Legarde and Sumandal (2022) found that teachers in remote Philippine communities experienced difficulties with online instruction, particularly when technological knowledge and digital competencies were inadequate. These challenges were more complex in the TVL track of Senior High School because specialized subjects require the application of technical knowledge through actual performance. Instruction commonly involves the use of tools, equipment, demonstrations, laboratory activities, and occupational procedures that cannot always be replicated through printed or digital materials. Masrom et al. (2022) observed that vocational institutions experienced considerable difficulty delivering and assessing practical competencies during pandemic restrictions. Consequently, teachers needed to modify demonstrations, contextualize performance tasks, and identify accessible methods of developing practical skills. In the Bondoc Peninsula, Schools Division of Quezon, the implementation of TVL instruction required consideration of geographical accessibility, learning resources, communication facilities, and the circumstances of learners. Examining the strategies teachers employed during the pandemic is therefore important for understanding how specialized instruction was sustained under constrained conditions and for identifying practices that may inform future learning continuity initiatives.

Recent literature identifies several interconnected factors influencing TVL instruction during educational disruptions, particularly competency-based teaching, instructional communication, technological integration, meaningful learner participation, teacher competence, and institutional support. First, competency-based and practice-oriented instruction remains fundamental to TVL education. Unlike predominantly theoretical subjects, vocational education requires learners to demonstrate occupational competencies through authentic tasks, practical exercises, and performance assessment. UNESCO (2022) emphasized that technical and vocational education should develop skills relevant to employment, entrepreneurship, lifelong learning, and transitions toward inclusive and sustainable economies. Similarly, Villacorta and Arnado (2023) demonstrated the importance of teachers' instructional competencies in implementing the Philippine TVL track, while identifying challenges involving assessment, facilities, instructional resources, and institutional partnerships. These findings reinforce the importance of aligning teaching strategies with occupational standards and opportunities for practical application. Furthermore, instructional communication constitutes an essential component of competency-based learning. Clear instructions, organized demonstrations, accessible communication channels, and timely feedback enable learners to understand technical procedures and complete assigned activities. During the pandemic, teachers relied increasingly on digital messaging applications, recorded lessons, online consultations, and alternative communication mechanisms. Jing et al. (2023) found that vocational institutions adapted emergency remote teaching through various digital platforms, instructional resources, communication methods, and assessment practices. Likewise, DeCoito and Estaiteyeh (2022) demonstrated that teachers' curriculum and assessment practices required substantial adjustments when instruction shifted online. Collectively, these studies suggest that communication strategies should be evaluated according to their clarity, accessibility, responsiveness, and contribution to meaningful learning. In addition, technology integration became a significant instructional mechanism during the pandemic. Digital platforms, mobile devices, instructional videos, and electronic learning resources enabled teachers to communicate with learners and provide alternative learning experiences. However, technology integration was not equally effective across educational settings. Masrom et al. (2022) noted that technological approaches helped vocational institutions continue instruction but did not fully resolve the difficulties associated with practical skills assessment. Similarly, Subrahmanyam and Elson-Rogers (2022) emphasized that the digital capabilities of TVET teachers depend on appropriate professional development, institutional resources, and opportunities to apply technology meaningfully. UNESCO (2023) further stressed that

educational technologies should complement sound pedagogical practices rather than substitute for essential human interaction. Accordingly, technology integration in TVL instruction should consider accessibility, instructional relevance, and practical competency requirements. Moreover, meaningful and inclusive learner participation remains essential to successful vocational education. Practical competencies require active engagement, opportunities for independent performance, appropriate feedback, and learning activities responsive to individual circumstances. Legarde and Sumandal (2022) demonstrated that technological competence influenced teachers' attitudes toward online instruction in remote Philippine communities, highlighting the importance of professional preparation for accessible learning delivery. Similarly, Jing et al. (2023) identified adaptive arrangements that combined synchronous instruction, asynchronous activities, demonstrations, learner collaboration, and alternative resources. These approaches demonstrate the importance of flexible instructional arrangements that accommodate varying levels of access and participation. Teacher characteristics and professional competencies also represent important considerations in instructional delivery. Villacorta and Arnado (2023) identified relationships between teachers' competencies, instructional skills, and selected professional characteristics in the implementation of the Philippine TVL track. Meanwhile, Abdul Raof et al. (2022) reported constraints involving technology and pedagogical competencies among vocational lecturers during emergency remote teaching. These findings indicate that demographic and professional characteristics may provide useful contextual information, although they should not automatically be interpreted as determinants of instructional effectiveness. Continuous professional development remains important for strengthening teachers' instructional flexibility, technological competence, and practical teaching capabilities (UNESCO & International Task Force on Teachers for Education 2030, 2024). Finally, instructional resources and institutional support influence teachers' ability to implement appropriate strategies. Inadequate equipment, insufficient instructional materials, connectivity limitations, and administrative responsibilities may restrict opportunities for practical learning. Rivera (2022) documented the substantial workload, competing responsibilities, and resource-related difficulties experienced by Filipino public school teachers during the pandemic. Similarly, Villacorta and Arnado (2023) identified deficiencies in facilities and instructional support affecting TVL implementation. Taken together, the literature indicates that effective TVL instruction requires the coordinated development of teacher competence, accessible learning resources, appropriate technology, meaningful learner engagement, and institutional preparedness.

At the local level, the Bondoc Peninsula in the Schools Division of Quezon provides an important setting for examining the instructional adjustments required in geographically dispersed communities. During the pandemic, TVL teachers needed to consider learners' access to devices, connectivity, instructional materials, and resources necessary for completing practical activities. Such circumstances made flexible communication, contextualized instruction, and accessible performance tasks particularly relevant. Although the experiences of teachers may vary across schools, documenting their instructional strategies provides localized evidence that can inform future preparedness and instructional improvement. At the national level, Philippine education policies increasingly emphasize educational recovery and resilience. The Department of Education (2022), through its Basic Education Development Plan 2030, identified access, equity, quality, and resilience as essential priorities for strengthening basic education. These priorities are relevant to TVL programs because specialized instruction requires appropriate facilities, qualified teachers, technical competencies, and learning opportunities responsive to students' circumstances. Legarde and Sumandal (2022) emphasized the need to improve teachers' technological preparation in remote Philippine communities, while Villacorta and Arnado (2023) identified instructional and resource-related concerns associated with TVL implementation. These findings highlight the continuing importance of institutional support and context-sensitive teaching strategies. At the global level, UNESCO (2022) identified vocational education as an important mechanism for developing employable skills and supporting transitions toward inclusive, digital, and sustainable economies. The organization emphasized the need to strengthen flexible learning opportunities, professional competencies, and equitable access to skills development. Furthermore, UNESCO (2023) recognized that the appropriate application of educational technology requires attention to accessibility, instructional quality, and learner needs. Complementing these perspectives, Jing et al. (2023) demonstrated how vocational institutions adapted instructional spaces, digital resources, and learning activities during emergency remote teaching. These developments provide an international context for examining instructional adaptability and educational resilience in the Philippine TVL system.

The study draws on the concepts of learning readiness, motivation, gender socialization, and adaptive instructional practices to understand how teachers respond to the demands of delivering specialized subjects under challenging educational conditions. The original theoretical foundation incorporates Thorndike's Law of Readiness and classical motivational perspectives associated with Maslow, Herzberg, McClelland, Vroom, and McGregor. Collectively, these perspectives provide conceptual explanations for the importance of preparedness, professional motivation, supportive working conditions, and the willingness to adjust instructional practices. Gender socialization provides an additional perspective for considering how social expectations and responsibilities may shape teachers' professional experiences without presuming that sex independently determines instructional competence. Recent evidence supports examining teacher readiness and professional conditions within contemporary educational environments. Rivera (2022) identified the influence of workload, competing

responsibilities, and institutional support on the experiences of Filipino teachers during the pandemic. Meanwhile, Abdul Raof et al. (2022) demonstrated that technological constraints and pedagogical competencies were important considerations in vocational lecturers' implementation of emergency remote teaching. UNESCO and the International Task Force on Teachers for Education 2030 (2024) likewise emphasized the importance of qualified, motivated, and adequately supported teachers in strengthening educational systems. Conceptually, the present study examines three principal dimensions of TVL instructional strategies: improved instructional communication, better technology integration, and more meaningful and inclusive participation. These dimensions are considered alongside respondents' age, sex, highest educational attainment, TESDA specialized certification, and length of teaching service, as well as the instructional problems experienced during the pandemic. The study uses these variables to describe teaching practices and determine whether differences exist across respondent groups. The findings provide the empirical basis for proposed policy guidelines intended to strengthen the continuity of TVL specialized instruction during future educational disruptions.

Although recent studies have examined emergency remote teaching, technological integration, teacher preparedness, and vocational education, gaps remain in understanding how these concerns intersect within specific local educational settings. Masrom et al. (2022) examined technological implementation and practical learning difficulties in TVET, while Jing et al. (2023) investigated emergency remote teaching practices in Chinese vocational institutions. These studies provide important insights into institutional adaptation but do not directly document the instructional strategies employed by public Senior High School TVL teachers in the Bondoc Peninsula. Within the Philippine context, Legarde and Sumandal (2022) investigated the experiences of teachers in remote communities, particularly their technological competencies and perceptions of online instruction. Meanwhile, Villacorta and Arnado (2023) examined teachers' competencies, instructional skills, and challenges in implementing the TVL track. Although these investigations address important components of educational delivery, the reviewed evidence does not specifically explain how instructional communication, technology integration, and meaningful learner participation were implemented together by TVL specialized-subject teachers in the selected Bondoc Peninsula schools during the pandemic. Furthermore, existing evidence indicates that instructional difficulties involve interconnected concerns, including technological limitations, practical assessment requirements, resource availability, teacher workload, and institutional preparedness (Rivera, 2022; Jing et al., 2023). However, the relative prominence of these concerns and the extent to which instructional strategies vary according to teachers' demographic and professional characteristics require context-specific examination. Therefore, the present study addresses these gaps by examining the strategies employed by TVL teachers in the Bondoc Peninsula during the COVID-19 pandemic. Specifically, it describes their demographic and professional profiles, assesses their instructional strategies across the three identified dimensions, determines whether significant differences exist when respondents are grouped according to their profiles, and identifies the problems encountered in teaching specialized subjects. Based on the findings, the study provides a basis for developing policy guidelines that may strengthen teacher preparedness, improve instructional support, and sustain competency-based education during pandemics, natural calamities, and similar disruptions.

The present study is primarily aligned with Sustainable Development Goal 4 (SDG 4), Quality Education, which promotes inclusive, equitable, and quality education and lifelong learning opportunities for all. Its relevance lies in examining how teachers sustained specialized vocational instruction despite limitations in technological access, instructional resources, practical training opportunities, and learner participation. UNESCO (2022) emphasized the importance of accessible, relevant, and inclusive skills development, while UNESCO (2023) highlighted the role of appropriate educational technology in supporting equitable learning opportunities. These priorities correspond to the study's focus on instructional communication, technology integration, and meaningful learner participation. More specifically, the study relates to SDG Target 4.4, which emphasizes developing skills relevant to employment and entrepreneurship, and SDG Target 4.c, which concerns the availability of qualified teachers. It also has relevance to SDG Target 4.5 through its consideration of equitable learner participation and access to instruction. The study does not directly measure achievement of these targets but may provide evidence for improving vocational instructional practices and teacher support. The study also has secondary relevance to Sustainable Development Goal 8 (SDG 8), Decent Work and Economic Growth, because TVL education develops occupational competencies that may support future employment and entrepreneurial opportunities. UNESCO (2022) identified skills development as an important component of productive employment, decent work, and inclusive economic transitions. By examining how teachers maintained opportunities for practical competency development during educational disruptions, the study may contribute to discussions on strengthening vocational preparation. However, employment outcomes and economic growth are not directly measured.

The study contributes primarily to educational, technological, institutional, and socio-economic sustainability by examining instructional approaches that may support the continuity of competency-based learning during emergencies. From an educational sustainability perspective, the investigation provides evidence on how TVL teachers adapted instructional communication, learner participation, and practical learning activities when conventional instructional arrangements were interrupted. Such evidence may inform flexible learning delivery, teacher professional development, and preparedness initiatives. The importance of adaptive learning arrangements

is consistent with UNESCO's (2022) emphasis on inclusive vocational education and the findings of Jing et al. (2023) concerning resilient emergency remote teaching practices. In terms of technological sustainability, the study examines how available digital resources and communication platforms supported instructional delivery despite connectivity and resource limitations. Subrahmanyam and Elson-Rogers (2022) emphasized that sustainable digital integration in vocational education requires continuing teacher capacity development and institutional support. Accordingly, the findings may help schools identify technology-related practices that are accessible, pedagogically appropriate, and feasible under constrained conditions. Regarding institutional sustainability, the study may provide school administrators and education policymakers with a basis for improving resource allocation, instructional support, professional development, and continuity planning. Rivera (2022) demonstrated the importance of institutional assistance and manageable workloads in supporting teachers, while UNESCO and the International Task Force on Teachers for Education 2030 (2024) emphasized the need for resilient educational systems supported by a competent teaching workforce. Finally, the study has implications for socio-economic sustainability through its focus on the continuity of practical skills development. TVL education serves as an important pathway for developing competencies relevant to employment, entrepreneurship, and further technical training. Villacorta and Arnado (2023) highlighted the relationship between teachers' competencies and instructional skills in TVL implementation. By identifying context-responsive strategies and instructional challenges, the present study may contribute to strengthening the delivery of vocational education, particularly in resource-constrained communities. Overall, the study's multidisciplinary sustainability contribution lies in generating contextual evidence that may support more accessible, adaptable, and resilient TVL instruction. Its proposed policy guidelines may assist educational institutions in maintaining opportunities for competency development during future disruptions while promoting instructional quality, equitable participation, technological adaptability, and institutional preparedness.

2. Material and methods

2.1 Research Design

The study utilized a quantitative descriptive-survey research design to assess the strategies employed by Senior High School TVL teachers in delivering specialized subjects during the COVID-19 pandemic. This approach was appropriate for describing teachers' demographic and professional characteristics, identifying instructional strategies, determining the frequency of their application, and examining the problems encountered during pandemic-related instructional disruptions. The descriptive-survey method also facilitated the collection of quantifiable data for statistical analysis and comparisons of teaching strategies across respondent groups.

2.2 Locale of the Study

The study was conducted in the Bondoc Peninsula, located in the Third Congressional District of Quezon Province, CALABARZON Region, Philippines. The district comprises 12 municipalities: Agdangan, Buenavista, Catanauan, General Luna, Macalelon, Mulanay, Padre Burgos, Pitogo, San Andres, San Francisco, San Narciso, and Unisan. The area consists predominantly of coastal and hilly communities and has 50 national high schools distributed across its municipalities. The locale was selected to assess the instructional strategies employed by TVL teachers during the pandemic. The researcher's professional experience as a TVL specialized-subject teacher in one of the district's technical-vocational high schools also contributed to the selection of the study setting.

2.3 Respondents of the Study

The respondents were Senior High School teachers handling TVL specialized subjects in public secondary schools within the Bondoc Peninsula, Schools Division of Quezon. The study included 91 TVL specialization teachers distributed across the district's 12 municipalities. The respondents were characterized according to age, sex, highest educational attainment, TESDA specialized certification, and length of service in teaching TVL. These demographic and professional characteristics were examined to describe the respondents and determine whether significant differences existed in their instructional strategies when grouped according to their profiles.

2.4 Sample and Sampling Procedure

The study employed purposive sampling, targeting teachers directly involved in teaching TVL specialized subjects in the selected public secondary schools of the Bondoc Peninsula. The selection focused on Senior High School TVL teachers whose instructional responsibilities were relevant to the study's objectives. The reported sample comprised 91 respondents, distributed as follows: Agdangan, 1; Buenavista, 3; Catanauan, 10; General Luna, 2; Macalelon, 5; Mulanay, 21; Padre Burgos, 4; Pitogo, 6; San Andres, 3; San Francisco, 13; San Narciso, 19; and Unisan, 4. All TVL specialization teachers were identified as the target respondents, and data collection was conducted through an online survey questionnaire.

2.5 Research Instrument

The researcher utilized a self-developed survey questionnaire administered through Google Forms to collect data from TVL teachers during the pandemic. The questionnaire was validated by one Master Teacher, one Head Teacher, and two English teachers. A pilot test involving 30 respondents who were excluded from the final data

gathering was conducted before the actual administration of the instrument. The questionnaire consisted of three parts. The first gathered the respondents' demographic and professional characteristics, including age, sex, highest educational attainment, TESDA specialized certification, and length of service in teaching TVL. The second assessed the strategies employed in teaching TVL specialized subjects across three dimensions: improved instructional communication strategies, better technology integration strategies, and more meaningful and inclusive participation strategies. The third examined the problems encountered by TVL teachers in delivering specialized subjects during the pandemic. A five-point rating scale was employed to assess the frequency of instructional strategy use and the degree of problems encountered. For instructional strategies, mean scores of 4.20–5.00 were interpreted as Always Used; 3.40–4.19 as Most of the Time Used; 2.60–3.39 as Sometimes Used; 1.80–2.59 as Rarely Used; and 1.00–1.79 as Never Used. For problems encountered, mean scores of 4.21–5.00 were interpreted as Very Frequently Encountered; 3.41–4.20 as Frequently Encountered; 2.61–3.40 as Moderately Encountered; 1.81–2.60 as Seldom Encountered; and 1.00–1.80 as Never Encountered.

2.6 Data Gathering Procedure

Data collection began with securing permission from the Schools Division Superintendent of the Division of Quezon, the concerned Public Schools District Supervisors, and the school heads of participating institutions. After obtaining the necessary permissions, the researcher distributed the validated questionnaire to the identified TVL teachers through Google Forms, with the assistance of concerned school personnel. Respondents completed the online questionnaire, and their responses were electronically collected through the platform. The retrieved data were subsequently organized and prepared for statistical analysis to address the study's research questions.

2.7 Data Analysis Techniques

The collected data were analyzed using descriptive and inferential statistical techniques appropriate to the study's objectives. Frequency counts and percentages were employed to describe the respondents' demographic and professional profiles, specifically their age, sex, highest educational attainment, TESDA specialized certification, and length of service in teaching TVL. Mean scores and rankings were used to assess the frequency of instructional strategies employed by TVL teachers in terms of improved instructional communication, better technology integration, and more meaningful and inclusive participation. Mean scores were also calculated to determine the degree to which teachers encountered problems in delivering TVL specialized subjects during the pandemic. The resulting scores were interpreted using the established five-point rating scales. Furthermore, the Kruskal–Wallis H test was employed to determine whether significant differences existed in the instructional strategies used by TVL teachers when respondents were grouped according to their demographic and professional characteristics. The statistical findings served as the basis for interpreting teachers' instructional practices, identifying major challenges, and formulating the proposed policy guidelines for teaching TVL specialized subjects during pandemics and natural calamities.

3. Results and Discussion

3.1 Demographic Profile of the respondents

3.1.1 Age, Sex, and Length of Teaching Service

The findings revealed that most respondents were aged 31–40 years (57.14%), followed by those aged 20–30 years (21.98%), 41–50 years (17.58%), and 51 years and above (3.30%). Female teachers comprised 73.63% of the respondents, while male teachers accounted for 26.37%. Regarding length of service, 37.36% had been teaching TVL subjects for 4–6 years, 34.07% for 7–9 years, 15.38% for 10 years or more, and 13.19% for 1–3 years. These findings indicate that the respondents were predominantly female and belonged to the 31–40 age group, with most having several years of experience teaching TVL specialized subjects. The distribution suggests that the respondents had varying levels of professional exposure and teaching experience, which provided a basis for examining differences in instructional strategy use. However, demographic characteristics alone do not establish differences in instructional practices, making further statistical comparison necessary.

3.1.2 Educational Attainment and TESDA Specialized Certification

In terms of educational attainment, 49.44% of the respondents held bachelor's degrees with master's units, followed by bachelor's degree holders (30.77%), master's degree holders (14.29%), master's degree holders with doctoral units (3.30%), and doctoral degree holders (2.20%). Regarding TESDA specialized certification, 52.75% possessed Trainer Methodology Level I certification, 30.77% held National Certificate II, 7.69% held National Certificate III, and 2.20% possessed Trainer Methodology Level II certification. Meanwhile, 6.59% had no national certification, and none possessed National Certificate IV. The findings indicate that a considerable proportion of the respondents had pursued graduate-level education and obtained technical certifications relevant to their teaching specializations. These qualifications reflect the academic preparation and technical competencies represented within the respondent group. In competency-based TVL education, professional preparation and specialized certification provide an important context for understanding teachers' ability to deliver occupationally relevant instruction and facilitate practical learning activities.

3.2 Strategies Used in Teaching TVL Specialized Subjects

3.2.1 Improved Instructional Communication Strategies

The results revealed that TVL teachers employed instructional communication strategies most of the time, obtaining an overall mean of 3.76. Providing clear explanations to help students understand lesson content received the highest mean of 4.58, followed by answering students' questions about their lessons (4.45) and providing instructions without rushing students through activities (3.99). Giving brief and understandable instructions obtained a mean of 3.43. Conversely, inviting resource persons to demonstrate specialized skills and share technical expertise received the lowest mean of 2.33, indicating that this strategy was rarely employed. These findings suggest that TVL teachers prioritized clear explanations, responsiveness to student inquiries, and manageable instructional procedures to sustain learning during the pandemic. Such practices were particularly important when direct classroom interaction was restricted and learners depended on alternative communication arrangements. The result is consistent with the instructional communication perspective attributed to Malkowski (2007, as cited by Myer (2017), which emphasizes improving communication between teachers and learners. However, the limited involvement of external resource persons suggests that opportunities for industry-related demonstrations and specialized practical instruction were less frequently utilized.

3.2.2 Better Technology Integration Strategies

Technology integration strategies obtained an overall mean of 3.87, interpreted as Most of the Time Used. The most frequently employed practice was using mobile phones and other gadgets to communicate with students and sustain their interest in specialized subjects (4.31). This was followed by the use of social media and digital platforms, including Messenger, Facebook, Google Classroom, and Google Meet (3.99), and the provision of video lessons and technology-based instructional materials demonstrating specialized skills (3.79). Using devices to reinforce classroom procedures obtained a mean of 3.71, while assisting students in using integrated software tools received the lowest mean of 3.53. The results indicate that TVL teachers incorporated accessible communication technologies and multimedia resources to maintain instructional delivery during pandemic-related restrictions. Mobile devices and digital platforms served as alternative channels for teacher–student interaction, while instructional videos supported the presentation of technical procedures. This finding relates to the importance of appropriately equipped and technology-supported vocational learning environments discussed by (Okorie, 2000 as cited by Castillo, 2012). Although technological resources facilitated instructional continuity, their integration remained dependent on the available platforms, teacher support, and opportunities for learners to apply specialized competencies.

3.2.3 More Meaningful and Inclusive Participation Strategies

Meaningful and inclusive participation strategies obtained the highest overall mean among the three instructional dimensions at 4.16, interpreted as Most of the Time Used. Providing feedback to improve students' work received the highest mean of 4.49, followed by establishing clear lesson goals through Work-Home Learning Plans (4.41). Reinforcing social-emotional skills, including empathy and compassion, obtained a mean of 4.20, while establishing connections with students through shared interests and experiences received a mean of 3.98. Providing varied instructional opportunities involving social issues, history, and current events received the lowest mean of 3.74. These findings emphasize the importance of feedback, structured learning goals, and supportive teacher–student relationships in sustaining meaningful participation during distance and flexible learning. The consistent provision of feedback helped teachers guide students in improving their outputs despite limited opportunities for direct supervision. The results correspond with the learner-centered perspective discussed by Eutopia (2005) as cited by Ramos (2016), which emphasizes active participation, individualized instruction, and appropriate learning resources. Thus, meaningful participation in TVL instruction extended beyond completing learning activities to include instructional guidance, emotional support, and opportunities for continuous improvement.

3.3 Significant Differences in Teaching Strategies According to Respondent Profiles

3.3.1 Differences According to Age and Sex

The Kruskal–Wallis H test revealed no statistically significant differences in the instructional strategies employed by TVL teachers when grouped according to age. The obtained p-values were 0.202 for instructional communication, 0.452 for technology integration, and 0.286 for meaningful and inclusive participation. Similarly, no significant differences were identified according to sex, with corresponding p-values of 0.496, 0.599, and 0.636. All values exceeded the 0.05 significance level; therefore, the null hypotheses for these comparisons were not rejected. The findings suggest that instructional strategy use was statistically comparable across age and sex categories among the respondents. This result is discussed in relation to professional competence, continuing development, and institutional support rather than demographic characteristics alone. UNESCO (2023), Scherer et al. (2022), Tondeur et al. (2022), and Darling-Hammond et al. (2022) emphasize the importance of professional learning and pedagogical preparation in instructional practice. Similarly, Trust and Whalen (2021) and Scherer et al. (2023) are cited regarding the contribution of digital competence and ICT-related professional development, while UNESCO (2022) and the European Agency for Special Needs and Inclusive Education (2023) provide perspectives on inclusive teaching. The original discussion also refers to the OECD's Teaching and Learning

International Survey (TALIS) 2024 and Philippine professional development initiatives in explaining the importance of continuing teacher preparation.

3.3.2 Differences According to Highest Educational Attainment

The results indicated no significant differences in instructional communication strategies ($H = 4.596$, $p = 0.331$) or technology integration strategies ($H = 1.734$, $p = 0.785$) when teachers were grouped according to highest educational attainment. However, a statistically significant difference was identified in meaningful and inclusive participation strategies ($H = 11.149$, $p = 0.025$). Master's degree holders obtained the highest mean rank of 63.65 in this dimension, followed by respondents with master's degrees and doctoral units at 58.67. Consequently, the null hypothesis was rejected for meaningful and inclusive participation but not for the other two instructional dimensions. These findings indicate that educational attainment was associated with statistically different levels of meaningful and inclusive participation strategy use within the respondent group. The original discussion relates this finding to the potential contribution of advanced academic preparation to pedagogical knowledge, differentiated instruction, and learner engagement. UNESCO (2022, 2023), Darling-Hammond et al. (2022), and the OECD's TALIS (2024) are cited regarding professional preparation and inclusive instructional practices. Meanwhile, Scherer et al. (2023) and Tondeur et al. (2022) emphasize the importance of targeted technological training and continuous professional development. Nevertheless, the significant group difference does not establish that higher educational attainment consistently produces greater use of inclusive strategies across every qualification level.

3.3.3 Differences According to TESDA Specialized Certification

The comparison according to TESDA specialized certification revealed no significant differences in instructional communication strategies ($H = 5.154$, $p = 0.272$) or technology integration strategies ($H = 3.788$, $p = 0.435$). However, a significant difference was observed in meaningful and inclusive participation strategies ($H = 10.834$, $p = 0.028$). Respondents with Trainer Methodology Level II certification obtained the highest mean rank of 74.75, while those without national certification recorded a mean rank of 26.58. Therefore, the null hypothesis was rejected for meaningful and inclusive participation but retained for instructional communication and technology integration. The findings suggest that TESDA certification categories were associated with differences in teachers' reported use of meaningful and inclusive participation strategies. The original discussion connects specialized certification with occupational competencies, authentic learning experiences, and the contextualization of practical instruction. The Technical Education and Skills Development Authority (TESDA, 2022–2025), UNESCO (2022, 2023), and the OECD's TALIS (2024) are cited concerning professional qualifications and competency-based instructional practices. Related professional development initiatives (DepEd, 2022–2025; TESDA, 2023) and studies by Tondeur et al. (2022) and Scherer et al. (2023) further emphasize the role of continuing training and instructional preparation. These perspectives support examining technical certification as a relevant professional characteristic, although the observed statistical difference does not independently establish a causal relationship.

3.3.4 Differences According to Length of Teaching Service

The Kruskal–Wallis H test showed no statistically significant differences in instructional strategies when respondents were grouped according to length of teaching service. Instructional communication strategies obtained $H = 4.257$ and $p = 0.235$, technology integration strategies obtained $H = 1.476$ and $p = 0.688$, and meaningful and inclusive participation strategies obtained $H = 3.522$ and $p = 0.318$. All p-values exceeded the 0.05 significance level, indicating that the null hypotheses were not rejected across the three instructional dimensions. The findings suggest that differences in teaching tenure were not associated with statistically significant differences in the reported instructional strategies. Although teaching experience may contribute to professional confidence and instructional familiarity, the original discussion emphasizes the importance of continuous professional development and institutional support. The OECD's TALIS (2024), UNESCO (2022, 2023), and Darling-Hammond et al. (2022) provide perspectives on professional learning and reflective instructional practice. Similarly, Scherer et al. (2023) and Tondeur et al. (2022) emphasize targeted ICT training and technological competence development. These perspectives suggest that teachers with different lengths of service may develop comparable instructional practices through continued professional learning and competency-based preparation.

3.4 Problems Encountered in Teaching TVL Specialized Subjects During the Pandemic

The assessment of instructional challenges yielded an overall mean of 3.82, indicating that teachers frequently experienced difficulties in delivering TVL specialized subjects during the pandemic. Excessive administrative workload emerged as the most prominent problem, obtaining a mean of 4.24. This was followed by insufficient connectivity for communicating with students (3.97), limited instructional materials (3.93), insufficient tools and equipment (3.86), shortages of printing materials and supplies (3.87), challenges involving students' and parents' attitudes toward learning modalities (3.81), and inadequate teacher training for alternative instructional arrangements (3.79). Difficulties in contacting parents and validating student performance both obtained means of 3.68, while concerns regarding the quality of instructional instructions received the lowest mean of 3.34. The

findings indicate that TVL teachers encountered interconnected administrative, technological, material, and instructional challenges. Excessive administrative responsibilities were identified as a major concern because these tasks could reduce the time available for preparing and delivering specialized instruction. Connectivity limitations and inadequate learning materials further complicated communication, demonstrations, and performance assessment. These concerns correspond with Perez's (2018) study, which identified deficiencies in instructional materials, facilities, and equipment in Philippine technical-vocational education. The findings therefore emphasize the importance of responsive resource allocation, appropriate teacher support, contextualized instructional materials, and coordinated institutional interventions for sustaining TVL instruction during emergencies.

3.5 Proposed Policy Guidelines for Teaching TVL Specialized Subjects During Pandemics and Natural Calamities

Based on the identified instructional strategies and challenges, the study developed proposed policy guidelines for sustaining the delivery of TVL specialized subjects during pandemics, natural calamities, and similar emergencies. The guidelines address four priority areas: improved instructional communication, better technology integration, meaningful and inclusive participation, and responsive management of instructional problems. The proposed implementation framework adopts an Assess–Plan–Implement–Monitor–Adapt (APIMA) cycle to guide schools in assessing emergency conditions, identifying instructional needs, implementing appropriate strategies, monitoring results, and making necessary adjustments. Implementation involves education supervisors, school administrators, TVL teachers, disaster risk reduction and management coordinators, learners, parents, local government units, and relevant industry and TESDA partners. The proposed policy translates the study's findings into a structured approach to instructional preparedness and continuity. Its emphasis on flexible communication, accessible technological resources, learner-responsive activities, professional development, stakeholder coordination, and periodic monitoring directly addresses the challenges identified by respondents. The guidelines also incorporate resource assessment, documentation of effective practices, and continuous improvement to strengthen institutional readiness. Although the policy is expected to support teacher preparedness, instructional adaptability, meaningful learner participation, and competency development, these outcomes remain proposed benefits rather than empirically evaluated results of policy implementation.

4. Conclusion & Recommendations

The study concluded that Technical-Vocational-Livelihood (TVL) teachers in the Bondoc Peninsula, Schools Division of Quezon, frequently employed instructional communication, technology integration, and meaningful and inclusive participation strategies during the COVID-19 pandemic, with meaningful and inclusive participation emerging as the most frequently practiced. The respondents were predominantly female, aged 31–40 years, bachelor's degree holders with master's units, Trainer Methodology Level I-certified, and had four to six years of teaching experience. No significant differences in instructional strategies were found when respondents were grouped according to age, sex, and length of service. However, meaningful and inclusive participation strategies differed significantly according to educational attainment and TESDA specialized certification. The major challenges encountered included excessive administrative workload, insufficient internet connectivity, limited instructional materials and equipment, and inadequate professional development opportunities. These findings provided the basis for developing proposed policy guidelines to strengthen instructional preparedness, learner engagement, and the continuity of competency-based TVL education during future educational disruptions.

It is recommended that school administrators strengthen continuous professional development programs focusing on technology integration, competency-based instruction, inclusive teaching practices, and emerging industry competencies. TVL teachers should be encouraged to pursue graduate education and obtain or upgrade relevant TESDA certifications to enhance their professional and technical qualifications. School leaders should also establish mentoring arrangements, strengthen partnerships with industries, local government units, and community stakeholders, and address shortages of instructional materials, equipment, and technological resources. Furthermore, unnecessary administrative responsibilities should be minimized to allow teachers to devote more time to instructional preparation and learner support. The proposed policy guidelines should be implemented, regularly monitored, and periodically evaluated to determine their effectiveness in addressing instructional challenges and strengthening educational continuity. Future researchers are encouraged to conduct similar investigations in other school divisions or regions using larger samples and additional variables to validate and expand the findings.

The study was limited to 91 Senior High School TVL teachers in the Bondoc Peninsula, Schools Division of Quezon, and focused on their instructional strategies and challenges during the COVID-19 pandemic. Data were obtained through a researcher-developed survey questionnaire and were based on teachers' self-reported experiences and practices. Consequently, the findings were confined to the respondents and educational circumstances examined and may not fully represent TVL instruction in other geographical or institutional

settings. Furthermore, although policy guidelines were developed from the findings, their effectiveness was not evaluated as part of the investigation.

5. Compliance with ethical standards

The authors affirm that no conflicts of interest exist in relation to this study. The study examined the instructional strategies and challenges experienced by Technical-Vocational-Livelihood (TVL) teachers in teaching specialized subjects during the COVID-19 pandemic in the Bondoc Peninsula, Schools Division of Quezon. Permission to conduct the research was obtained from the Schools Division Superintendent, concerned Public Schools District Supervisors, and participating school heads. The study involved 91 Senior High School TVL teachers who responded to a researcher-developed questionnaire administered through Google Forms. The research procedures were non-invasive and focused exclusively on teachers' professional characteristics, instructional practices, and experiences during pandemic-related educational disruptions. Findings were presented in aggregated form without identifying individual respondents. The study did not involve experimental interventions, psychological assessments, or access to students' confidential academic records.

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