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Implementation Of Sustainable Development Goal 4 Basis For Technical Training Among TVL Strand Students And Teachers' Practices In CD 4, SDO Batangas Province

Angelie V. Hernandez [1]
1 – Golden Gate Colleges
angelie.hernandez001@deped.gov.ph / 0009-0008-9984-3302

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Abstract

This study examined the relationship between teachers' implementation of Sustainable Development Goal 4 (SDG 4) in the technical training of Technical-Vocational-Livelihood (TVL) students and the extent of their SDG 4-oriented practices in Congressional District IV, Division of Batangas Province, during School Year 2025–2026. Using a descriptive-quantitative research design, the study surveyed 137 TVL teachers from public and private senior high schools through a structured questionnaire. Data were analyzed using weighted mean, standard deviation, and Pearson's correlation coefficient.

Findings revealed that SDG 4 implementation was highly evident in curriculum content, while instructional strategies, learning resources, and assessment practices were moderately implemented. Teachers' SDG 4-oriented practices were likewise moderately practiced across school-based activities, community engagement and extension programs, work immersion and industry linkages, and entrepreneurial initiatives. Correlation analysis showed a statistically significant moderate positive relationship between teachers' implementation of SDG 4 in technical training and their SDG 4-oriented practices, $r = .573$, $p < .001$. This indicates that stronger integration of SDG 4 in technical training is associated with more evident SDG 4-oriented practices in broader school, community, industry, and entrepreneurship-related activities.

The study further found that teachers encountered moderate challenges in implementing SDG 4, particularly in relation to students' varying readiness and motivation, inadequate facilities and equipment, large class sizes, and limited support systems. Based on these findings, the study proposed the SDG 4–Aligned Technical Training Enhancement Program (STTEP) as an intervention framework to strengthen SDG 4 implementation in TVL education. The study recommends improving institutional support, providing adequate instructional resources, conducting teacher capacity-building programs, and strengthening partnerships with community and industry stakeholders.

Keywords: *SDG 4, technical training, TVL strand, SDG 4 implementation, SDG 4-oriented practices, technical-vocational education, STTEP*

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Methodology

Research Design

This study employed a **descriptive-quantitative research design** to assess the implementation of Sustainable Development Goal 4 in the technical training of TVL students in Congressional District IV, Division of Batangas Province. This design was deemed appropriate because the study measured the degree of teachers' implementation of SDG 4 in terms of curriculum content, instructional strategies, learning resources, and assessment practices. It also examined the extent of teachers' SDG 4-oriented practices relative to school-based activities, community engagement and extension programs, work immersion and industry linkages, and entrepreneurial initiatives. Furthermore, the study identified the challenges encountered by teachers and determined the significant relationship between SDG 4 implementation in technical training and teachers' SDG 4-oriented practices.

Participants

The participants of the study were TVL teachers from public and private senior high schools in Congressional District IV, Division of Batangas Province, during School Year 2025–2026. From a total population of 137 TVL teachers, a sample of 102 respondents was determined using **Slovin's formula at a 5 percent margin of error**. Stratified random sampling with proportionate allocation was employed to ensure that all participating schools were represented according to the size of their TVL teacher population. Each school served as a stratum, and the respondents were randomly selected from the list of TVL teachers per school.

Research Instrument

The study used a **researcher-made questionnaire** as the primary data-gathering instrument. It was composed of three main parts that measured:

- teachers' implementation of SDG 4 in technical training in terms of curriculum content, instructional strategies, learning resources, and assessment practices;
- teachers' SDG 4-oriented practices in terms of school-based activities, community engagement and extension programs, work immersion and industry linkages, and entrepreneurial initiatives; and
- challenges encountered by teachers in implementing SDG 4 in the TVL strand.

A four-point Likert scale was used to quantify the responses. An **interview guide** was also used as a supplementary instrument to gather teachers' experiences, challenges, and suggestions regarding SDG 4 implementation. Both instruments were researcher-made and validated by experts before administration.

Data Collection Procedure

Before data collection, the researcher secured approval from the Schools Division Superintendent of SDO Batangas Province for the participating public secondary schools and from the administrators of the participating private senior high schools. After permission was granted, the researcher coordinated with school personnel to obtain the list of TVL teachers,

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which served as the basis for stratified random sampling with proportionate allocation. The questionnaires were distributed to the selected respondents either in printed form or through an online survey link, depending on accessibility and convenience.

Informed consent was obtained from all participants prior to the administration of the instruments. The purpose of the study, procedures, possible risks and benefits, confidentiality measures, and voluntary nature of participation were clearly explained. The study also observed ethical research practices and complied with the Data Privacy Act of 2012. Completed questionnaires and interview responses were collected, checked, coded, and organized systematically to ensure accuracy, confidentiality, and readiness for analysis.

Data Analysis

The data were analyzed using descriptive and inferential statistical procedures. Ranking was used to determine the order of indicators based on their weighted means. Weighted means were used to describe the degree of teachers' implementation of SDG 4 in technical training, the extent of their SDG 4-oriented practices, and the level of agreement on the challenges encountered. Standard deviation was used to determine the variation in respondents' answers. Pearson's coefficient of correlation was used to determine the presence, direction, and strength of the relationship between teachers' implementation of SDG 4 in technical training and the extent of their SDG 4-oriented practices. Qualitative responses from the interview guide were analyzed to identify recurring ideas and insights that supported the quantitative findings.

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Results

Section 1: Degree of Teachers' Implementation of SDG 4 in the Technical Training of TVL Students

Table 1
Teachers' Implementation of SDG 4 in the Technical Training of TVL Students in Terms of Curriculum Content

Indicators	WM	SD	VI	Rank
1. I include workplace ethics in technical subject content, such as honesty, discipline, and accountability.	3.71	.4563	HI	2
2. I include SDG 4 concepts in my lesson objectives, such as inclusion, equity, and quality education.	3.48	.5015	MI	6
3. I include lifelong learning skills in my TVL subject competencies, such as adaptability, initiative, and self-improvement.	3.57	.6838	HI	5
4. I align my curriculum content with quality education standards by including relevant knowledge, skills, and values.	3.35	.6597	MI	10
5. I include safety, responsibility, and accountability in technical subject content, especially in the use of tools and equipment.	3.95	1.6991	HI	1
6. I integrate sustainability concepts into industry-based competencies, such as waste reduction, resource conservation, and responsible material use.	3.47	.5430	MI	7
7. I include content that reflects inclusive and equitable quality education for learners with different needs, abilities, and backgrounds.	3.46	.5559	MI	8
8. I include topics that support equal learning opportunities in technical subjects, regardless of sex, ability, or social background.	3.69	.4784	HI	3
9. I include content that connects technical skills with environmentally responsible work practices, such as energy saving, safe material handling, and proper waste disposal.	3.41	.5081	MI	9
10. I include topics that show how technical work supports sustainable community and industry development, such as responsible production, productive employment, and community-based livelihood.	3.58	.4947	HI	4
Composite Mean	**3.567**	**0.37438**	**HI**	

Legend: *3.50-4.00 - Highly Implemented | 2.50-3.49 – Moderately Implemented | 1.50-2.49 – Slightly Implemented | 1.00-1.49 – Least Implemented*

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1.1 Curriculum Content. The degree of teachers' implementation of SDG 4 in the technical training of TVL students in terms of curriculum content obtained a composite mean of 3.567, interpreted as Highly Implemented (HI). Among the indicators, the inclusion of safety, responsibility, and accountability in technical subject content ranked the highest with a weighted mean of 3.95, followed by the inclusion of workplace ethics such as honesty, discipline, and accountability with a weighted mean of 3.71, and the inclusion of topics supporting equal learning opportunities regardless of sex, ability, or background with a weighted mean of 3.69.

Meanwhile, aligning curriculum content with quality education standards obtained the lowest weighted mean of 3.35, followed by the integration of environmentally responsible work practices with a weighted mean of 3.41, and the inclusion of content addressing diverse learner needs with a weighted mean of 3.46, all interpreted as Moderately Implemented.

Table 2
Teachers' Implementation of SDG 4 into the Technical Training of the Students in Terms of Instructional Strategies

Indicators	WM	SD	VI	Rank
1. I use collaborative tasks in hands-on activities, such as pair work, group practice, and shared technical tasks.	3.60	.4920	HI	2
2. I use project-based tasks to develop technical competencies, such as planning, creating, and presenting outputs.	3.58	.5105	HI	4
3. I use problem-based learning in technical instruction, such as solving workplace-related issues and practical job tasks.	3.69	.4813	HI	1
4. I use student-centered methods in classroom instruction, such as guided practice, peer interaction, and active participation.	3.30	.6682	MI	9
5. I use reflective activities during training sessions, such as self-checking, feedback sharing, and reflection on task performance.	3.59	.5081	HI	3
6. I use teaching approaches that promote inclusive participation during technical training, such as giving all learners equal chances to join activities.	3.50	.6765	HI	6
7. I use strategies that address diverse learner needs, such as adjusting instructions, pacing, and task difficulty based on learners' abilities.	3.57	.5257	HI	5
8. I use lessons that foster innovation and critical thinking, such as idea generation, decision-making, and improvement of technical outputs.	3.48	.5434	MI	7
9. I use digital tools to improve access to learning, such as video demonstrations, online instructions, and digital platforms for technical activities.	3.11	.7141	MI	10
10. I use teaching practices that support lifelong learning habits, such as independent task completion, self-monitoring, and continuous skills improvement.	3.40	.6582	MI	8
Composite Mean	3.481	**0.36853**	**MI**	

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Legend: *3.50-4.00 - Highly Implemented | 2.50-3.49 – Moderately Implemented | 1.50-2.49 – Slightly Implemented | 1.00-1.49 – Least Implemented*

1.2 Instructional Strategies. The degree of teachers' implementation of SDG 4 in the technical training of TVL students in terms of instructional strategies obtained a composite mean of 3.481, interpreted as Moderately Implemented (MI). Among the indicators, the use of problem-based learning in technical instruction ranked the highest with a weighted mean of 3.69, followed by the use of collaborative tasks in hands-on activities with a weighted mean of 3.60, and the use of reflective activities during training sessions with a weighted mean of 3.59. On the other hand, the use of digital tools to improve access to learning obtained the lowest weighted mean of 3.11, followed by the use of student-centered methods with a weighted mean of 3.30, and teaching practices that support lifelong learning habits with a weighted mean of 3.40, all interpreted as Moderately Implemented.

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Table 3
Teachers' Implementation of SDG 4 into the Technical Training of the Students in Terms of Learning Resources

Indicators	WM	SD	VI	Rank
1. I use updated technical references in instructions, such as current manuals, guidebooks, and industry-based sources.	3.23	.6063	MI	3
2. I use digital platforms that support technical skill development, such as video lessons, simulations, and online practice activities.	2.31	.6615	SI	10
3. I use instructional materials that promote inclusive and equitable learning, such as resources suited to different learning needs and levels.	3.39	.8077	MI	1
4. I use learning resources that are accessible to students with varied abilities, such as clear texts, visual guides, and easy-to-follow instructions.	2.69	.6367	MI	9
5. I use industry-standard tools and materials that reflect sustainable practices, such as proper resource use, waste reduction, and safe handling.	2.71	.4722	MI	8
6. I use supplementary materials for learners needing additional support, such as review sheets, step-by-step guides, and simplified learning tasks.	2.80	.7558	MI	7
7. I use resources that reflect gender sensitivity and cultural awareness, such as examples, images, and situations that are respectful and inclusive.	2.91	.5487	MI	6
8. I use materials that encourage the development of 21st-century skills, such as critical thinking, collaboration, communication, and digital literacy.	3.03	.4688	MI	5
9. I use learning materials that incorporate community-based examples, such as local livelihood activities, environmental practices, and familiar workplace situations.	3.12	.5348	MI	4
10. I provide equipment and tools equitably during practical tasks, such as giving all learners fair access to devices, materials, and technical resources.	3.31	.4784	MI	2
Composite Mean	**2.951**	**0.17240**	**MI**	

Legend: *3.50-4.00 - Highly Implemented | 2.50-3.49 – Moderately Implemented | 1.50-2.49 – Slightly Implemented | 1.00-1.49 – Least Implemented*

1.3 Learning Resources. The degree of teachers' implementation of SDG 4 in the technical training of TVL students in terms of learning resources obtained a composite mean of 2.951, interpreted as Moderately Implemented (MI). Among the indicators, the use of instructional materials that promote inclusive and equitable learning ranked the highest with a weighted mean of 3.39, followed by providing equipment and tools equitably during practical tasks with a weighted mean of 3.31, and the use of updated technical references such as manuals

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and industry-based sources with a weighted mean of 3.23. Meanwhile, the use of digital platforms to support technical skill development obtained the lowest weighted mean of 2.31, followed by the use of accessible learning resources for varied abilities with a weighted mean of 2.69, and the use of industry-standard tools reflecting sustainable practices with a weighted mean of 2.71.

Table 4
Teachers' Implementation of SDG 4 into the Technical Training of the Students in Terms of Assessment Practices

Indicators	WM	SD	VI	Rank
1. I use rubrics that are clearly explained before assessment activities.	3.29	.620	MI	8
2. I provide feedback that helps students improve their technical performance.	3.50	.5018	HI	3
3. I use performance-based tasks to assess technical competencies and applied skills.	3.57	.6730	HI	2
4. I use assessment methods that measure both theoretical knowledge and practical skills.	3.68	.4840	HI	1
5. I use evaluation procedures that ensure fairness and transparency in scoring and grading.	3.50	.5303	HI	3
6. I use alternative assessment methods that accommodate diverse learners, such as oral, written, and demonstration-based tasks.	3.37	.8033	MI	7
7. I assess critical thinking skills during practical tests, such as problem-solving, decision-making, and task improvement.	3.10	.8339	MI	10
8. I consider lifelong learning skills in grading, such as responsibility, adaptability, and independent task completion.	3.50	.6656	HI	3
9. I use industry standards in evaluating competencies, such as accuracy, safety, quality of output, and proper work procedures.	3.11	.8461	MI	9
10. I use assessment results to improve instruction, such as revising lessons, adjusting activities, and providing additional learner support.	3.48	.5156	MI	6
Composite Mean	**3.408**	**0.47233**	**MI**	

Legend: *3.50-4.00 - Highly Implemented | 2.50-3.49 – Moderately Implemented | 1.50-2.49 – Slightly Implemented | 1.00-1.49 – Least Implemented*

1.4 Assessment Practices. The degree of teachers' implementation of SDG 4 in the technical training of TVL students in terms of assessment practices obtained a composite mean of 3.408, interpreted as Moderately Implemented (MI). Among the indicators, the use of assessment

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methods that measure both theoretical knowledge and practical skills ranked the highest with a weighted mean of 3.68, followed by the use of performance-based tasks with a weighted mean of 3.57, and the provision of feedback, fairness, and transparency in evaluation with a weighted mean of 3.50. In contrast, assessing critical thinking skills during practical tests obtained the lowest weighted mean of 3.10, followed by the use of industry standards in evaluating competencies with a weighted mean of 3.11, and the use of clearly explained rubrics before assessment activities with a weighted mean of 3.29.

Section 2: Extent of Teachers' SDG 4-Oriented Practices

Table 5

Extent of Teachers' SDG 4-Oriented Practices in Terms of School-Based Activities

Indicators	WM	SD	VI	Rank
1. Skills demonstrations, exhibits, or fairs are organized to showcase student learning.	3.30	.6459	MP	9
2. School-based trainings are conducted to strengthen technical and life skills.	3.39	.6779	MP	8
3. Collaborative planning among teachers ensures quality learning activities.	3.52	.6653	HP	2
4. School activities are regularly monitored and evaluated to improve learning outcomes.	3.50	.5163	HP	3.5
5. School programs provide all learners with equal opportunities to participate in academic and co-curricular activities.	3.42	.6713	MP	5.5
6. Remedial classes, tutorial sessions, and other academic support activities are provided for learners who need additional assistance.	3.41	.4934	MP	7
7. School initiatives promote equality and respect for diversity through inclusive activities, fair participation, and acceptance of learners' differences.	3.42	.5105	MP	5.5
8. Students are given opportunities to lead or participate in activities that support educational improvement, such as peer mentoring, school projects, and academic programs.	3.59	.4934	HP	1
9. School activities include tasks that develop learners' critical thinking and problem-solving skills, such as analysis, decision-making, and practical application.	3.50	.5018	HP	3.5
10. SDG 4 principles are reflected in school-based academic and co-curricular activities through academic contests, technical skills training, and student development programs that promote inclusion and quality education.	3.20	.6399	MP	10
Composite Mean	**3.424**	**0.29193**	**MP**	

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Legend: *3.50-4.00 - Highly Practiced | 2.50-3.49 – Moderately Practiced | 1.50-2.49 – Slightly Practiced | 1.00-1.49 – Least Practiced*

2.1 School-Based Activities. The extent of teachers' SDG 4-oriented practices in terms of school-based activities obtained a composite mean of 3.424, interpreted as Moderately Practiced (MP). Among the indicators, providing students with opportunities to lead or participate in activities that support educational improvement ranked the highest with a weighted mean of 3.59, followed by collaborative planning among teachers with a weighted mean of 3.52, and the inclusion of tasks that develop learners' critical thinking and problem-solving skills with a weighted mean of 3.50. Meanwhile, the explicit reflection of SDG 4 principles in school-based academic and co-curricular activities obtained the lowest weighted mean of 3.20, followed by the organization of skills demonstrations and exhibits with a weighted mean of 3.30, and the conduct of school-based trainings with a weighted mean of 3.39.

Table 6
Extent of Teachers' SDG 4-Oriented Practices in Terms of Community Engagement and Extension Programs

Indicators	WM	SD	VI	Rank
1. Outreach programs are conducted to support access to education in the community.	2.63	.5287	MP	9
2. Extension activities provide relevant skills training for community members.	3.10	.5462	MP	7
3. Parents and community stakeholders are actively involved in school programs.	3.00	.6417	MP	8
4. Teachers participate in educational advocacy initiatives in the community.	3.38	.5019	MP	2
5. Community-based projects are integrated into students' learning experiences.	3.29	.6295	MP	3
6. Partnerships with local organizations support inclusive educational opportunities.	3.20	.7558	MP	5.5
7. Information campaigns promoting quality education are conducted in the community.	3.50	.6765	HP	1
8. Volunteer activities are organized to extend educational services beyond the school.	2.29	.6435	SP	10
9. Community feedback is utilized in improving school programs.	3.22	.5906	MP	4
10. Extension initiatives promote sustainable and lifelong learning in the locality.	3.20	.5958	MP	5.5
Composite Mean	**3.080**	**0.43822**	**MP**	

Legend: *3.50-4.00 - Highly Practiced | 2.50-3.49 – Moderately Practiced | 1.50-2.49 – Slightly Practiced | 1.00-1.49 – Least Practiced*

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2.2 Community Engagement and Extension Programs. The extent of teachers' SDG 4-oriented practices in terms of community engagement and extension programs obtained a composite mean of 3.080, interpreted as Moderately Practiced (MP). Among the indicators, conducting information campaigns that promote quality education in the community ranked the highest with a weighted mean of 3.50, interpreted as Highly Practiced, followed by teachers' participation in educational advocacy initiatives with a weighted mean of 3.38, and the integration of community-based projects into students' learning experiences with a weighted mean of 3.29. On the other hand, organizing volunteer activities obtained the lowest weighted mean of 2.29, interpreted as Slightly Practiced, followed by outreach programs with a weighted mean of 2.63, and stakeholder involvement in school programs with a weighted mean of 3.00.

Table 7

Extent of Teachers' SDG 4-Oriented Practices in Terms of Work Immersion and Industry Linkages

Indicators	WM	SD	VI	Rank
1. Work immersion programs are aligned with students' specialization and career goals.	3.31	.6594	MP	8.5
2. Industry partners are involved in planning and evaluating immersion activities.	3.48	.5300	MP	3
3. Equal opportunities are provided to students in work immersion placements.	3.39	.6779	MP	6.5
4. Industry supervisors provide structured mentoring during immersion.	3.42	.6713	MP	5
5. Work immersion activities develop students' technical and employability skills.	3.31	.6481	MP	8.5
6. Teachers regularly monitor students' performance during immersion.	3.39	.6887	MP	6.5
7. Industry linkages ensure training reflects current labor market demands.	3.09	.9508	MP	10
8. Safety and professional standards are emphasized during immersion activities.	3.51	.5162	HP	1
9. Reflection activities are conducted during and after immersion to enhance learning.	3.50	.5163	HP	2
10. Partnerships with industries are sustained to improve training quality.	3.47	.6972	MP	4
Composite Mean	**3.385**	**0.48472**	**MP**	

Legend: *3.50-4.00 - Highly Practiced | 2.50-3.49 – Moderately Practiced | 1.50-2.49 – Slightly Practiced | 1.00-1.49 – Least Practiced*

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2.3 Work Immersion and Industry Linkages. The extent of teachers' SDG 4-oriented practices in terms of work immersion and industry linkages obtained a composite mean of 3.385, interpreted as Moderately Practiced (MP). Among the indicators, emphasizing safety and professional standards during immersion activities ranked the highest with a weighted mean of 3.51, followed by reflection activities with a weighted mean of 3.50, both interpreted as Highly Practiced, and the involvement of industry partners in planning and evaluation with a weighted mean of 3.48. In contrast, ensuring alignment with current labor market demands obtained the lowest weighted mean of 3.09, followed by alignment with students' specialization with a weighted mean of 3.31, and the development of technical and employability skills with a weighted mean of 3.31.

Table 8

Extent of Teachers' SDG 4-Oriented Practices in Terms of Entrepreneurial Initiatives

Indicators	WM	SD	VI	Rank
1. Teachers mentor students in financial management.	3.31	.6704	MP	3.5
2. Students are guided in developing business plans.	3.22	.4151	MP	7
3. Students are given opportunities to market products or services.	3.08	.7282	MP	9
4. School-based enterprises provide experiential learning opportunities.	3.01	.6474	MP	10
5. Income-generating projects are aligned with students' technical competencies.	3.29	.4875	MP	5.5
6. Sustainable and responsible business practices are promoted in student projects.	3.20	.4511	MP	8
7. Entrepreneurial initiatives are evaluated to improve student learning outcomes.	3.29	.4843	MP	5.5
8. Entrepreneurial activities are integrated into instructional programs through product-making, business planning, and income-generating projects.	3.31	.6594	MP	3.5
9. Community or industry partners support entrepreneurial initiatives through mentoring, product feedback, resource assistance, and market linkage opportunities.	3.37	.6967	MP	2
10. Entrepreneurial activities develop students' creativity and innovation skills through product design, idea generation, and problem-solving tasks.	3.49	.5302	MP	1
Composite Mean	**3.256**	**0.38974**	**MP**	

Legend: *3.50-4.00 - Highly Practiced | 2.50-3.49 – Moderately Practiced | 1.50-2.49 – Slightly Practiced | 1.00-1.49 – Least Practiced*

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2.4 Entrepreneurial Initiatives. The extent of teachers' SDG 4-oriented practices in terms of entrepreneurial initiatives obtained a composite mean of 3.256, interpreted as Moderately Practiced (MP). Among the indicators, the development of students' creativity and innovation skills ranked the highest with a weighted mean of 3.49, followed by support from community or industry partners with a weighted mean of 3.37, and the integration of entrepreneurial activities and financial mentoring with a weighted mean of 3.31. Meanwhile, school-based enterprises obtained the lowest weighted mean of 3.01, followed by opportunities for students to market products or services with a weighted mean of 3.08, and the promotion of sustainable and responsible business practices with a weighted mean of 3.20.

Section 3: Relationship Between the Degree of Teachers' Implementation of SDG 4 in Technical Training and the Extent of Teachers' SDG 4-Oriented Practice

Table 9
Relationship Between the Degree of Teachers' Implementation of SDG 4 in Technical Training and the Extent of Teachers' SDG 4-Oriented Practices Among TVL Strand Students in Terms of School-Based Activities

Degree of Teachers' Implementation	r-value	p-value	Interpretation	Decision	Conclusion
Curriculum Content	.593	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Instructional Strategies	.677	.000	Strong Positive Relationship	Reject the Null	Significant strong positive relationship
Learning Resources	.509	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Assessment Practices	.625	.000	Strong Positive Relationship	Reject the Null	Significant strong positive relationship

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TABLE 10
Relationship Between the Degree of Teachers' Implementation of SDG 4 in Technical Training and the Extent of Teachers' SDG 4-Oriented Practices Among TVL Strand Students in Terms of Community Engagement and Extension Programs

Degree of Teachers' Implementation	r-value	p-value	Interpretation	Decision	Conclusion
Curriculum Content	.102	.237	No Significant Relationship	Failed to Reject the Null	Not significant
Instructional Strategies	.099	.251	No Significant Relationship	Failed to Reject the Null	Not significant
Learning Resources	.325	.000	Weak Positive Relationship	Reject the Null	Significant weak positive relationship
Assessment Practices	.142	.098	No Significant Relationship	Failed to Reject the Null	Not significant

The relationship between the degree of teachers' implementation of SDG 4 in technical training and the extent of teachers' SDG 4-oriented practices yielded an overall Pearson r value of 0.573 with a p-value of $p < .001$, indicating a significant moderate positive relationship.

In terms of school-based activities, all variables showed significant relationships. Curriculum content had a significant moderate positive relationship with school-based activities with an r-value of 0.593. Instructional strategies had a significant strong positive relationship with school-based activities with an r-value of 0.677. Learning resources had a significant moderate positive relationship with school-based activities with an r-value of 0.509, while assessment practices had a significant strong positive relationship with school-based activities with an r-value of 0.625.

In terms of community engagement and extension programs, only learning resources showed a significant weak positive relationship with an r-value of 0.325. Curriculum content, instructional strategies, and assessment practices showed no significant relationship with community engagement and extension programs, with r-values of 0.102, 0.099, and 0.142, respectively.

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TABLE 11
Relationship Between the Degree of Teachers' Implementation of SDG 4 in Technical Training and the Extent of Teachers' SDG 4-Oriented Practices Among TVL Strand Students in Terms of Work Immersion and Industry Linkages

Degree of Teachers' Implementation	r-value	p-value	Interpretation	Decision	Conclusion
Curriculum Content	.483	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Instructional Strategies	.554	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Learning Resources	.505	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Assessment Practices	.740	.000	Strong Positive Relationship	Reject the Null	Significant strong positive relationship

In terms of work immersion and industry linkages, all variables showed significant relationships. Curriculum content had a significant moderate positive relationship with work immersion and industry linkages with an r-value of 0.483. Instructional strategies had a significant moderate positive relationship with an r-value of 0.554. Learning resources also had a significant moderate positive relationship with an r-value of 0.505, while assessment practices had a significant strong positive relationship with an r-value of 0.740.

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TABLE 12

Relationship Between the Degree of Teachers' Implementation of SDG 4 in Technical Training and the Extent of Teachers' SDG 4-Oriented Practices Among TVL Strand Students in Terms of Entrepreneurial Initiatives

Degree of Teachers' Implementation	r-value	p-value	Interpretation	Decision	Conclusion
Curriculum Content	.339	.000	Weak Positive Relationship	Reject the Null	Significant weak positive relationship
Instructional Strategies	.505	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Learning Resources	.412	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship
Assessment Practices	.537	.000	Moderate Positive Relationship	Reject the Null	Significant moderate positive relationship

In terms of entrepreneurial initiatives, all variables showed significant relationships. Curriculum content had a significant weak positive relationship with entrepreneurial initiatives with an r-value of 0.339. Instructional strategies had a significant moderate positive relationship with an r-value of 0.505. Learning resources had a significant moderate positive relationship with an r-value of 0.412, while assessment practices had a significant moderate positive relationship with an r-value of 0.537.

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Section 4: Challenges Teachers Encounter in Implementing Sustainable Development Goal 4 in the TVL Strand

TABLE 13
Challenges Teachers Encounter in Implementing Sustainable Development Goal 4 in the TVL Strand

Indicators	WM	SD	VI	Rank
1. I lack sufficient training on how to effectively integrate SDG 4 principles into my TVL instruction.	2.93	.5770	A	6
2. I find it difficult to align SDG 4 concepts with the existing TVL curriculum competencies.	2.72	.4689	A	10
3. Limited instructional materials and resources hinder my implementation of SDG 4-oriented activities.	2.83	.6251	A	7
4. Insufficient time within the curriculum makes it challenging for me to incorporate SDG 4-related initiatives.	3.07	.7239	A	5
5. I receive limited administrative support in implementing SDG 4 practices in the TVL strand.	3.10	.5725	A	4
6. Large class sizes make it difficult for me to apply inclusive and equitable learning strategies aligned with SDG 4.	3.37	.5424	A	3
7. Inadequate facilities, tools, or equipment affect my ability to deliver SDG 4-oriented technical training effectively.	3.39	.6779	A	2
8. I encounter difficulty in assessing students' learning outcomes related to SDG 4 competencies.	2.78	.6268	A	9
9. Limited collaboration with industry and community partners constrains my implementation of SDG 4 initiatives.	2.80	.6512	A	8
10. Students' varying levels of readiness and motivation make it challenging for me to promote inclusive and quality education practices.	3.55	.5684	SA	1
Composite Mean	**3.054**	**0.31389**	**A**	

Legend: *3.50-4.00 – Strongly Agree | 2.50-3.49 – Agree | 1.50-2.49 – Disagree | 1.00-1.49 – Strongly Disagree*

The challenges teachers encountered in implementing Sustainable Development Goal 4 in the TVL strand obtained a composite mean of 3.054, interpreted as Agree (A). Among the indicators,

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students' varying levels of readiness and motivation ranked the highest with a weighted mean of 3.55, followed by inadequate facilities, tools, or equipment with a weighted mean of 3.39, and large class sizes with a weighted mean of 3.37. These results indicate that learner-related, resource-related, and classroom management factors were the most commonly encountered challenges.

Meanwhile, difficulty in aligning SDG 4 concepts with existing TVL curriculum competencies obtained the lowest weighted mean of 2.72, followed by difficulty in assessing students' learning outcomes related to SDG 4 competencies with a weighted mean of 2.78, and limited collaboration with industry and community partners with a weighted mean of 2.80. These findings indicate that although such challenges were present, they were less frequently experienced compared with student readiness, limited facilities, and large class size.

Section 5: Proposed Intervention Activities

Based on the findings, the study proposed the SDG 4–Aligned Technical Training Enhancement Program (STTEP) as a set of intervention activities intended to strengthen the implementation of SDG 4 in technical training and improve teachers' SDG 4-oriented practices. The proposed activities focused on capacity-building for teachers, development of contextualized and digital learning resources, strengthening of school-based and community-based programs, enhancement of work immersion and industry linkages, promotion of entrepreneurial initiatives, provision of learner support mechanisms, and implementation of monitoring and evaluation processes.

The proposed intervention activities were developed to address areas with moderate levels of implementation and practice, particularly learning resources, community engagement, work immersion and industry linkages, and entrepreneurial initiatives. They were also designed to respond to the challenges identified in the study, particularly student readiness, limited facilities and equipment, large class sizes, and the need for stronger institutional support systems

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Intervention Activities: SDG 4–Aligned Technical Training Enhancement Program (STTEP)

COMPONENTS	INTERVENTION ACTIVITY	OBJECTIVE	PERSONS INVOLVED	TIME FRAME	RESOURCES NEEDED	MONITORING AND EVALUATION INDICATORS
Capacity-Building	SDG 4 Implementation and Assessment Training Workshop	teachers' skills in implementing and assessing SDG 4 in	School Heads, Master Teachers, TVL Teachers, External Trainers/SDO	2–3 days (INSET) + LAC twice a month	ICT equipment, SDG 4 references, handouts, assessment templates, and	trained • Submitted SDG 4-integrated lesson plans • Quality of assessment tools (rubric-based evaluation)
Learning Resource Enhancement	Development of SDG 4-Based Technical Training Resource Pack	and contextualized resources for SDG 4-based	Teachers, ICT Coordinators, Curriculum Developers	4–8 weeks (via LAC sessions)	guides, SDG 4 references, computers, printer, validation tools, and printing	instructional materials • Validation results from peer/expert review • Utilization rate of materials in class • Repository of finalized
School and Community Partnership	Oriented Community Engagement and Extension	community activities that promote	Teachers, Students, LGU Partners, NGOs, Community	1–2 days/ activity, 2–3 times/ semester	communication letters, activity materials, documentation tools, transport,	established (MOA/MOU) • Number of community activities conducted • Participation rate of students and stakeholders
Work Immersion and Industry Linkage	Immersion and Industry Alignment Enhancement	immersion activities with industry standards and labor	Immersion Coordinators, Industry Partners, Teachers,	(aligned with immersion schedule) + LAC monitorin	MOA/MOU, logbooks, monitoring tools, safety materials, transport, and	deployed in immersion • Industry partner feedback ratings • Completed immersion logbooks and reports • Alignment of tasks with
Entrepreneurial Development	Enterprise and Sustainable Entrepreneurship Developme	students entrepreneurial skills through sustainabl	Teachers, Students, School Heads, Industry Mentors	6–10 weeks (1 semester) + LAC monitorin	materials, business plan templates, costing sheets, marketing	business plans produced • Number of products/services developed • Sales/output records
Learner Support	Inclusive Learning Support and Technical Remediation Program	with technical competency gaps through	Teachers, Guidance Counselors, Peer Tutors, School Heads	Continuous (monthly LAC review)	assessment tools, remediation modules, activity sheets, support plan templates, and printing	(pre-post performance) • Evaluation of project • Attendance in remediation sessions • Individualized support plans developed • Improvement in

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Discussion

The findings indicate that TVL teachers in Congressional District IV, Division of Batangas Province generally implemented Sustainable Development Goal 4 in technical training, with curriculum content rated as highly implemented and instructional strategies, learning resources, and assessment practices rated as moderately implemented. This suggests that teachers were able to incorporate SDG 4 principles more strongly in what they teach, particularly in terms of safety, responsibility, accountability, workplace ethics, and equal learning opportunities. However, the moderate results in instructional strategies, learning resources, and assessment practices show that SDG 4 implementation still needs further strengthening in how instruction is delivered, how resources are provided, and how learning outcomes are evaluated. This finding supports the study's premise that SDG 4 in TVL education should not only be reflected in curriculum content but also in teaching methods, materials, and assessment practices that promote inclusive, relevant, and quality technical training.

The moderate extent of teachers' SDG 4-oriented practices further suggests that SDG 4 was present in school-based activities, community engagement, work immersion and industry linkages, and entrepreneurial initiatives, but these practices were not yet fully maximized. School-based activities were relatively stronger, indicating that teachers provided learners with opportunities for participation, collaboration, and skills development within the school setting. However, community engagement and extension programs obtained lower results, particularly in volunteer activities and outreach programs. This implies that while SDG 4 principles were evident inside the school, stronger efforts are needed to extend technical learning to the community. This finding is consistent with the idea that TVL education should connect classroom learning with real-life applications, community needs, workplace exposure, and livelihood-oriented experiences.

The significant moderate positive relationship between teachers' implementation of SDG 4 in technical training and their SDG 4-oriented practices shows that stronger classroom-based implementation is associated with stronger application of SDG 4 beyond regular instruction. The overall Pearson r value of 0.573 indicates that when teachers integrate SDG 4 through curriculum content, instructional strategies, learning resources, and assessment practices, they are also more likely to demonstrate SDG 4-oriented practices in school-based activities, work immersion, industry linkages, and entrepreneurial initiatives. However, the non-significant relationships found in some areas of community engagement suggest that classroom implementation alone may not automatically translate into community-based practice. This means that community engagement may require additional institutional support, stronger partnerships, and clearer implementation mechanisms.

The identified challenges provide a clearer explanation for the moderate levels of implementation and practice. Teachers agreed that they encountered challenges in implementing SDG 4 in the TVL strand, particularly students' varying levels of readiness and motivation, inadequate facilities, tools, or equipment, and large class sizes. These findings indicate that SDG 4 implementation is affected not only by teacher competence but also by learner-related, resource-related, and classroom management factors. Interview results also showed concerns

regarding the difficulty of integrating SDG concepts into technical competencies, the absence of clear assessment guides, and inconsistent coordination with industry and community partners. These results suggest that SDG 4 implementation in TVL requires stronger instructional support, clearer assessment frameworks, adequate resources, and sustained collaboration with stakeholders.

Generally, the results justify the development of the SDG 4–Aligned Technical Training Enhancement Program (STTEP) as a structured intervention for strengthening SDG 4 implementation in TVL education. Since the findings revealed moderate implementation in learning resources, assessment practices, community engagement, work immersion, and entrepreneurial initiatives, the proposed program appropriately focuses on teacher capacity-building, learning resource enhancement, school and community partnerships, work immersion and industry linkage improvement, entrepreneurial development, learner support, and monitoring and evaluation. Through these components, STTEP directly addresses the gaps and challenges identified in the study, particularly limited resources, student readiness, large class sizes, and the need for stronger institutional and stakeholder support.

Conclusion

This study demonstrated that Sustainable Development Goal 4 was implemented in the technical training of TVL students in Congressional District IV, Division of Batangas Province, particularly in curriculum content, while instructional strategies, learning resources, assessment practices, and SDG 4-oriented practices still required further strengthening. The significant moderate positive relationship between SDG 4 implementation and teachers' SDG 4-oriented practices indicates that stronger integration of SDG 4 in technical training is associated with better school-based, community-based, industry-linked, and entrepreneurial practices. However, challenges such as students' varying readiness and motivation, inadequate facilities and equipment, large class sizes, and limited support systems affected its full implementation. Thus, the proposed SDG 4–Aligned Technical Training Enhancement Program (STTEP) provides a structured intervention to strengthen SDG 4 implementation and improve the delivery of quality, inclusive, and sustainable TVL education.

References

Abad, J. A., Sasa, D., Medenilla, P., & Pastofide, C. (2025). Preferred learning strategies of Technical Vocational Teacher Education courses in Quezon Province, Philippines: Bases for an intervention action plan. *, 2*(3), 18–51.

Abdul, A. M., & Silor, A. C. (2024). Assessing the teaching strategies and techniques used by TVL teachers: Basis for pedagogical training design. *International Journal for Multidisciplinary Research, 6*(3).

Adlit, M. F., & Zaide, M. S. (2025). Strengthening Gulayan sa Paaralan or School Garden Program through learners' awareness of food sustainability. *European Journal of Innovative Studies and Sustainability, 1*(6), 70–88.

Ahmad, N., Noorani, Z., & Channa, N. (2025). Exploring the role of teachers in promoting SDG 4: Quality education and lifelong learning in the classroom. *ACADEMIA International Journal for Social Sciences, 4*(4), 3663–3676.

Alinea, J. M. L. (2021). Evaluation of technical-vocational teacher education program towards an academe- and industry-responsive curriculum. *Journal of Technical Education and Training, 13*(4), 65–81.

Barrera, R. (2022, December). Availability of instructional materials model of the technical-vocational livelihood curriculum implementation for public senior high schools. In *International Conference on Emerging Technology and Interdisciplinary Sciences* (pp. 89–113).

Bercasio, R. R. O., & Remolacio, L. K. Q. (2022). Mainstreaming environmental education in the teacher education curriculum in the Philippines. *International Journal of Evaluation and Research in Education, 11*(3), 1552–1561. https://doi.org/10.11591/ijere.v11i3.21748

Castro, L. A. (2023). *A training model for beginning Home Economics senior high school teachers* [Unpublished dissertation]. Philippine Normal University.

Chinedu, C. C., Saleem, A., & Wan Muda, W. H. N. (2023). Teaching and learning approaches: Curriculum framework for sustainability literacy for technical and vocational teacher training programmes in Malaysia. *Sustainability, 15*(3), 2543. https://doi.org/10.3390/su15032543

Cudiamat, M. A., & Valdez, M. L. A. (2022). Community stakeholders' knowledge and awareness of the ecological and socio-economic uses of mangroves in Calatagan, Batangas, Philippines. *International Journal of Conservation Science, 13*(4), 1319–1332.

Dema-Ala, J. P. (2024). *Technical-Vocational-Livelihood (TVL) teachers' capability and challenges in the development of instructional materials* [Unpublished thesis]. Eastern Samar State University.

Department of Education. (2013). *DepEd Order No. 55, s. 2013: Implementing rules and regulations of the Anti-Bullying Act of 2013.*

Department of Education. (2015). *DepEd Order No. 40, s. 2015: K to 12 partnership guidelines.*

Department of Education. (2017). *DepEd Order No. 30, s. 2017: Guidelines for work immersion.*

Department of Education. (2018). *DepEd Order No. 39, s. 2018: Clarification and additional information to DepEd Order No. 30, s. 2017.*

Domingo, J. G., & Mina, J. C. (2024). Attitudes, practices, and challenges in technology integration within the industrial classroom: The context of TVL track in SHS. *Pakistan Journal of Life & Social Sciences, 22*(2).

Dua, D. M., & Matildo, E. L. (2025). Advancing sustainability: The role of green entrepreneurship on micro, small, and medium enterprises. *International Journal of Advance Research and Innovative Ideas in Education, 11*(3), 2931–2938.

Dzurenda, M. (2022). *Leadership development in education for sustainable development: Evaluation of higher education students in sustainable development programs* [Doctoral dissertation]. University of Santo Tomas.

Enriquez, A. J. (2025). Level of awareness on the utilization of online resources and services among selected senior high school students in Manila. *Journal of Interdisciplinary Perspectives, 3*(10), 301–313.

Florek-Paszkowska, A., & Ujwary-Gil, A. (2025). The digital-sustainability ecosystem: A conceptual framework for digital transformation and sustainable innovation. *Journal of Entrepreneurship, Management and Innovation, 21*(2), 116–137. https://doi.org/10.7341/20252127

Gabriel, J. J. B., Maligmat, F. J., Laya, L. F., Lumanglas, G., & Nieva, L. A. (2025). *Public awareness, perceptions, and attitudes toward renewable energy in the rural communities of San Juan, Batangas: A basis for community education extension program.* Unpublished research paper.

Genizera, J. B. C., Tosino, W. F., Santacera, E. M., & Moncera, A. M. (2022). Implementation of Department of Education programs, projects, and activities on mitigating the impact of climate change in the Philippines. *Journal of Learning and Development Studies, 2*(1), 35–39. https://doi.org/10.32996/jlds.2022.2.1.4

Guevarra, J. Q. (2023). *Towards a professional development program on codependency in the workplace for teachers and education leaders* [Unpublished dissertation]. Philippine Normal University.

Hasiron, A. S. (2025). Promoting quality education through the integration of sustainable development in elementary school curricula: The case of Jolo III District–Sulu. *Journal of Education and Academic Settings, 2*(1), 1–19.

Hidalgo, J. A. M., Fabro, R. B. B., Castro, M. S., Cruz, K. L. D., Perez, K. M. P., Quiaoit, J. M. P., & Juan, S. M. G. (2025). Teaching strategies and their effects on competency assessment performance of senior high school students. *International Journal of Research and Innovation in Social Science, 9*(8), 4439–4455.

Holst, J., Brock, A., Grund, J., Schlieszus, A.-K., & Singer-Brodowski, M. (2025). Whole-school sustainability at the core of quality education: Wished for by principals but requiring collective and structural action. *Journal of Cleaner Production, 519*, 145897. https://doi.org/10.1016/j.jclepro.2025.145897

Hussain, M., & Munawar, U. (2025). Assessing the implementation of quality education under SDG 4 at the higher secondary level. *Journal of Educational Sciences & Research, 12*(1).

John, M. (Ed.). (2025). *The Routledge handbook of global sustainability education and thinking for the 21st century.* Routledge.

Kilag, O. K. T., et al. (2024). Technical vocational education in the Philippines for sustainable development. *European Journal of Higher Education and Academic Advancement, 1*(2), 57–70.

López, F., Contreras, M., Nussbaum, M., Paredes, R., Gelerstein, D., Alvares, D., & Chiuminatto, P. (2023). Developing critical thinking in technical and vocational education and training. *Education Sciences, 13*(6), 590.

Martínez Valdivia, E., Pegalajar Palomino, M. del C., & Burgos-García, A. (2023). Active methodologies and curricular sustainability in teacher training. *International Journal of Sustainability in Higher Education, 24*(6), 1364–1380. https://doi.org/10.1108/IJSHE-05-2022-0168

Mejia, M. B. (2023). *No student left behind: An analysis of the distance learning method in the light of the COVID-19 pandemic vis-à-vis the Philippine government's role in guaranteeing the constitutional right to quality education for all* [Unpublished thesis]. University of the Philippines College of Law.

Méndez, D., Méndez, M., & Anguita, J. M. (2022). Digital teaching competence in teacher training as an element to attain SDG 4 of the 2030 Agenda. *Sustainability, 14*(18), 11387. https://doi.org/10.3390/su141811387

Mendoza, J. M. (2024). Management of experiential learning loss of Bachelor of Technical-Vocational Teacher Education students. *Journal of Interdisciplinary Perspectives, 2*(7), 41–58.

Metante, J. T. (2024). Elevating educational quality: Evaluating the Senior High School (SHS)–Technical Vocational Livelihood (TVL) caregiving program with Stufflebeam's CIPP (context, input, process, and product) evaluation model. *International Journal of Educational Researchers, 15*(3), 30–43. https://doi.org/10.29329/ijer.2024.1061.3

Miramon, S., Kilag, O. K., Groenewald, E., & Barayuga, L. (2024). Teacher leadership in the Philippines: Evaluating its impact on K–12 education reform. *International Multidisciplinary Journal of Research for Innovation, Sustainability, and Excellence, 1*(1), 162–167.

Moughal, N. (2025). *Effect of environmental education on waste sorting behavior in Chinese secondary schools: SDG 12 and SDG 4 perspective.* Xi'an Jiaotong University.

Nellas, L. (2022). Sustainable quality in Technology Vocational Livelihood (TVL) instruction through technology intervention. *Psychology and Education: A Multidisciplinary Journal, 5*(1), 21–40.

Nonyana, M. S., Mtshali, T. I., & Makgato, M. (2024). Intervention strategies to improve Technical Vocational Education and Training college students' efficacy towards their education. *Kurdish Studies, 12*(2), 2802–2817.

Oguejiofor, V. I., Ogbonna, G. N., Nwafor, B. C., & Odewale, O. T. (2022). Strategies for scaling-up educational interventions in Technical and Vocational Education and Training (TVET) for sustainable development in Nigeria. *NeuroQuantology, 20*(14), 543–549.

Pham Xuan, R., & Håkansson Lindqvist, M. (2025). Exploring sustainable development goals and curriculum adoption: A scoping review from 2020–2025. *Societies, 15*(8), 212.

Poral, M. G. (2021). *Senior high school learners' knowledge, practices, and attitude on selected sustainable development goals* [Unpublished master's thesis]. West Visayas State University.

Ramos, B. G. (2024). *Intervention plan for school–LGU partnership for the alignment of the Technical-Vocational-Livelihood track and the local development plan* [Unpublished thesis]. Batangas State University.

Redman, A., Wiek, A., & Barth, M. (2021). Current practice of assessing students' sustainability competencies: A review of tools. *Sustainability Science, 16*, 117–135.

Republic of the Philippines. (1994). *Technical Education and Skills Development Act of 1994.* Official Gazette.

Republic of the Philippines. (2013). *Enhanced Basic Education Act of 2013.* Official Gazette.

Romero, M. R. R. (2023). *Challenges encountered and interventions adopted in teaching Technical Vocational Livelihood (TVL) in public schools in the Division of Catanduanes* [Unpublished master's thesis]. Catanduanes State University.

Sasaki, O., Yonehara, A., & Kitamura, Y. (2024). The influence of the whole school approach on implementing education for sustainable development in Japan. *Prospects.*

Soomro, R. B. K., Soomro, A. B., & Soomro, A. H. G. (2025). Advancing SDG-4 through AI and STEAM-integrated curriculum for inclusive medical education: A scoping review proposing the INSPIRE model.

Suarez, C. (2025). *Teacher-led initiatives on solid waste management program among elementary schools in the Division of Batangas City* [Unpublished thesis]. Golden Gate Colleges.

Tengco, V. Y. (2025). Policy gaps in SHS work immersion and employability. *International Journal of Research, 14*(14), 197–208.

Towip, I. W., Saputra, T. W., Noviansyah, W., & Trianingsih, L. (2021). TVET institutions' perspective on implementation of public-private partnerships model in Southeast Asia. *Journal of Physics: Conference Series, 1808*, 012007.

UNESCO. (2017). *Education for sustainable development goals: Learning objectives.* UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000247444

UNESCO. (2022). *Transforming technical and vocational education and training for successful and just transitions: UNESCO strategy 2022–2029.* UNESCO.

UNESCO. (n.d.). *Technical and vocational education and training (TVET).* https://www.unesco.org/en/skills-work-life

UNESCO-UNEVOC. (2021). *Technical and vocational education and training for sustainable development.* UNESCO-UNEVOC.

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development.* United Nations. https://sdgs.un.org/2030agenda

United Nations. (2023). *The sustainable development goals report 2023.* United Nations. https://unstats.un.org/sdgs/report/2023

Umesh, P., & Sivakumar, N. (2025). Corporate social responsibility for SDG 4: Inclusive and equitable education for India 2047.

Vallesteros, M. F. (2022). School learning environment and the employability scheme for Grade 12 Technical Vocational Livelihood (TVL) students. *Asia Pacific Journal of Advanced*

Education and Technology, Special Issue, 99–106. https://doi.org/10.54476/apjaet/46906

Voeller, J. (2025). Challenges and strategies for expanding enterprise-based training to develop skills for the ICT industry in the Philippines. *International Journal for Research in Vocational Education and Training, 12*(3), 338–359.

Weiss, M., Barth, M., & von Wehrden, H. (2021). The patterns of curriculum change processes that embed sustainability in higher education institutions. *Sustainability Science, 16*, 1579–1593.

Yakub, A. (2023). *Assessing the role of the Northern Education Initiative (NEI) Plus teacher training program in enhancing teachers' professional development in Gamawa, Bauchi State, Nigeria* [Doctoral dissertation]. University of Santo Tomas.

Ydo, Y. (2021). *Toward a sustainable future: Integrating climate change into curriculum*