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Students' Skills In Technology And Livelihood Education And Teachers' Contextualized Strategies In Congressional District I, SDO Batangas Province

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Abstract

Technology and Livelihood Education (TLE) equip learners with practical competencies essential for economic empowerment, yet student technical skill acquisition remains heavily dependent on instructional delivery. Contextualized instruction serves as a strategic framework to bridge classroom concepts with socio-economic realities and industry standards.

This study assessed the level of technical skills demonstrated by Junior High School students and the extent of utilization of contextualized teaching strategies among TLE teachers in Congressional District I, Schools Division Office (SDO) of Batangas Province, to serve as a basis for proposing enhanced instructional materials.

Utilizing a descriptive-correlation research design, data were collected from 141 purposively and stratified randomly sampled public secondary school TLE teachers using a validated, Four-point Likert scale survey questionnaire and supplemented by focus group discussions. Data analysis was executed using weighted means, rankings, and Pearson r correlation coefficients.

Junior High School students demonstrated an "Above Average" level of technical proficiency across all competency areas, led by occupational safety and health practices (WM = 3.32) and tool/equipment handling (WM = 3.31), but marked by relative weaknesses in complex applied ICT operations (WM = 2.99). Teachers "Highly Utilized" contextualized instructional strategies (Composite Mean= 3.66), particularly in tailoring lessons to real-world applications (WM = 3.68). A significant positive correlation was established between students' technical skills and teachers' contextualized strategies, notably in tool handling ($r = .52$, $p < .001$). However, teachers moderately encountered critical challenges (Composite Mean = 2.81), top-ranked by a lack of localized teaching and learning materials (WM = 3.02).

Contextualized teaching strategies significantly enhance technical skill development. To optimize learning outcomes and resolve localized resource gaps, the implementation of instructional materials that are commendable for technical skills gaps of students and strong utilization of contextualized strategies.

Keywords: *students, skills, Technology and Livelihood Education, teachers contextualized strategies.*

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1. Introduction

Technology and Livelihood Education (TLE) play a pivotal role in equipping learners with practical competencies essential for personal growth and national development. As a core component of the K to 12 curriculum in the Philippines, TLE aims to cultivate technical skills, a strong work ethic, and entrepreneurial capabilities among Junior High School (JHS) students, preparing them for real-world challenges and future employment opportunities.

The United Nations 2030 Agenda serves as a primary developmental framework for this study, particularly through Sustainable Development Goal 4 (SDG 4), which promotes quality and inclusive education. Under this goal, Target 4.3 mandates equal access to affordable, quality technical and vocational training, while Target 4.4 emphasizes a substantial increase in the number of youth and adults possessing technical and vocational skills relevant to employment, decent jobs, and entrepreneurship. This study exemplifies the practical implementation of these global objectives, as TLE serves as the principal educational mechanism for imparting essential technical skills to students entering the contemporary workforce. By evaluating student technical skills, this research directly measures the effectiveness of contextualized teaching strategies designed to bridge the gap between classroom instruction and real-world industrial skills.

In response to changing educational demands, the Department of Education (DepEd) has intensified its advocacy for contextualized instruction an approach that adapts teaching strategies and learning content to reflect local culture, community realities, and industry demands. This pedagogical shift is anchored in the *Enhanced Basic Education Act of 2013 (Republic Act 10533)*, which promotes learner-centered, inclusive, and relevant education. Within this framework, TLE plays a critical role in anchoring academic concepts into practical, localized competencies, particularly in Congressional District I, Schools Division Office (SDO) of Batangas Province. Contextualized teaching strategies is more than a curriculum enhancement; it is a strategic response to an evolving labor market. By aligning classroom instruction with local industry standards, schools can better prepare students for technical work, entrepreneurship, and lifelong learning, while fostering community engagement, grass-roots innovation, and critical problem-solving skills among learners.

Locally, teachers in Congressional District I of SDO Batangas Province encounter multifaceted barriers, top-ranked by a critical shortage of sufficient teaching and learning materials contextualized to local industries, followed closely by limited training and professional development opportunities in contextualized delivery, and a severe lack of updated, industry-standard laboratory facilities, tools, and equipment. Furthermore, instructional planning is heavily constrained because educators are forced to independently adapt generic learning guides to mirror local socioeconomic realities, requiring extra time and resources that are rarely available. This issue is exacerbated by systemic personnel mismatches, where educators are frequently assigned to teach strands outside their fields of specialization (such as an ICT teacher handling Agri-Fishery Arts or Industrial Arts), leading to compromised instructional confidence and a decline in student outcomes.

On the learners' side, students display a range of operational difficulties that hinder their technical skill development. Many entry-level junior high school students come from rural or economically disadvantaged backgrounds and have minimal prior exposure to tools, machinery, or

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digital interfaces, which produces low self-efficacy and severe anxiety during performance-based activities. Cognitive gaps are pronounced in areas requiring numeracy and precision; students routinely struggle with basic mathematical applications, which restricts their capability to perform accurate mensuration and calculations essential in strands like Carpentry, Electronics, and Dressmaking. In ICT components, restricted computer and internet access impedes software navigation and basic coding. Compounding these problems is a deep-seated motivational issue: learners frequently perceive TLE as a secondary subject lacking academic weight, which, when coupled with an absence of structured immersion programs, industry role models, and site visits, diminishes student engagement and obscures the direct relevance of TLE to their future aspirations.

Having served as a TLE educator for more than two years, the researcher has firsthand observation of these varying levels of technical skills among junior high school students. While some students thrive in hands-on tasks, many face significant hurdles applying theoretical principles to real-world scenarios. These compounded resource gaps, pedagogical constraints, and learner barriers highlight an urgent need for targeted, context-appropriate interventions, specifically through the design of localized instructional materials. While a broad body of research exists regarding the generic Technical-Vocational-Livelihood (TVL) track, there remains confined research explicitly tracing how contextualized teaching strategies enhance student acquisition of specific technical skills during the formative junior high school phase. There is a pressing need to examine how contextualized teaching strategies in TLE can be optimized to address technical skill gaps and align educational outcomes with local industry needs. To address this gap, this study investigates the relationship between the utilization of contextualized instructional strategies by teachers and the technical skills demonstrated by junior high school students in Congressional District I, SDO Batangas Province, as a framework for designing responsive, industry-aligned instructional modules.

Statement of the Problem

This study aims to determine the utilization of contextualized teaching strategies in Technology and Livelihood Education (TLE) and the technical skills of Junior High School students in Congressional District I, Schools Division Office of Batangas Province.

Specifically, it sought answers to the following questions:

1. What is the level of technical skills demonstrated by the students, as assessed by the teachers, in the following competency areas:
    1.1. tool and equipment handling;
    1.2. mensuration and calculation;
    1.3. occupational safety and health practices; and
    1.4. basic programming and ICT Operations?
2. To what extent of utilization are contextualized teaching strategies in TLE be assessed by the respondents in terms of:
    2.1. relevance to real-world applications;
    2.2. responsiveness to specific learners' needs; and
    2.3. promotion of community engagement?

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3. Is there any significant relationship between the assessments on the level of technical skills of the students in TLE and the extent of utilization of contextualized teaching strategies?

4. What challenges do teachers encounter in implementing contextualized teaching strategies in TLE?

5. What proposed instructional materials may be prepared to support contextualized teaching strategies?

2. Materials and Methods

This part outlines the methodological framework used to execute the study. It details the research design, participants and sampling techniques, research instruments, data collection procedures, and the specific data analysis methods used to evaluate the relationship between teachers' contextualized teaching strategies and students' technical skills**.**

Research Design

This study utilized a descriptive correlation research design to examine the relationship between the assessment on the level of technical skills of the students in TLE and on the extent of utilization of contextualized teaching strategies.

The descriptive correlation design was appropriate for this study which aimed to identify patterns, frequencies, correlations, and categories related to the implementation of contextualized teaching strategies in TLE and the technical skills demonstrated by junior high school students. Specifically, the study assessed students' technical skills in four key competency areas: tool and equipment handling, mensuration and calculation, occupational safety and health practices, and basic programming and ICT operations. It also evaluates the extent to which contextualized instructional strategies are utilized by TLE teachers, focusing on their relevance to real-world applications, responsiveness to learners' specific needs, and promotion of community engagement.

This study employed a quantitative research method using a survey questionnaire as the primary instrument for data collection. The questionnaire was designed to gather information on the level of technical skills among students and the extent of utilization of contextualized teaching strategy. To validate the responses of the survey participants, the researcher also conducted focus group discussions involving twelve selected TLE teachers from Congressional District I, Schools Division of Batangas Province. The results were analyzed to determine the relationship between technical skills of students and contextualized teaching strategies in TLE, identify challenges encountered by teachers, and inform the development of proposed enhancement activities to improve contextualized teaching strategies in TLE.

Participants

The respondents of the study were 141 TLE teachers from public secondary schools in Congressional District I, Division of Batangas during the school year 2025-2026. Slovin’s formula, with a 5% margin of error, was utilized to calculate the sample size, resulting in a total of 141

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respondents. Subsequently, stratified random sampling with proportionate allocation was employed to determine the number of respondents from each school district.

Instrument

This study utilized a survey questionnaire and focus group discussions as the main instruments to assess the level of technical skills of junior high school students and the extent of utilization of contextualized teaching strategies in Technology and Livelihood Education (TLE). This section describes the construction, validation, administration, retrieval, and scoring of responses.

Procedure

The initial draft of the questionnaire was reviewed by the thesis adviser and TLE experts. Their feedback was incorporated into a revised version, which was submitted to educational specialist, including master teachers, and school administrators, for further validation. The instrument was also reviewed by a grammarian to ensure clarity and correctness. Upon final approval, the validated questionnaire was encoded and reproduced for distribution.

Questionnaire. A researcher-made questionnaire was developed and distributed to TLE teacher-respondents. Part I, consist of 39 items that assessed the level of students' technical skills in four key competency areas: tool and equipment handling, mensuration and calculation, occupational safety and health practices, and basic programming and ICT operations. Teachers evaluated student proficiency across these areas using a 4-point rating scale:

4 (3.50–4.00): High (H)
3 (2.50–3.49): Above Average (AA)
2 (1.50–2.49): Below Average (BA)
1 (1.00–1.49): Low (L)

Part II consists of 30 items that evaluated the extent of utilization of contextualized instructional strategies in terms of relevance to real-world applications, responsiveness to learners' needs, promotion of community engagement. It also quantified the challenges teachers faced using a corresponding scale:

4 (3.50–4.00): Highly Utilized (HU)
3 (2.50–3.49): Moderately Utilized (MU)
2 (1.50–2.49): Slightly Utilized (SU)
1 (1.00–1.49): Least Utilized (LU)

Part III consists of 10 items which focused on identified challenges encountered by teachers in implementing contextualized instructional strategies.

4 (3.50–4.00): Strongly Agree (SA)
3 (2.50–3.49): Agree (A)
2 (1.50–2.49): Disagree (D)
1 (1.00–1.49): Strongly Disagree (SD)

Focus Group Discussion (FGD) Guide

To validate the responses from the survey, the researcher conducted a focus group discussion among the twelve selected TLE teachers from Congressional District I. The discussion explored deeper insights into the implementation of contextualized teaching strategies, observed student technical skills,

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and encountered challenges. Questions were formulated based on the survey results and relevant literature to ensure alignment with the study's objectives.

Data Procedure

The data for this study was collected using two methods: a survey questionnaire and focus group discussions (FGDs) with selected respondents. Before administering the instruments, the researcher secured the necessary permissions from relevant authorities, including the Office of the Schools Division Superintendent in Batangas Province, the Office of the Public Schools District Supervisor in Congressional District I, and the school heads of the participating secondary schools.

Once all approvals have been obtained, the researcher administered the survey questionnaire to TLE teachers. An informed consent form was included in the questionnaire, and respondents were assured that all information collected was treated with strict confidentiality in accordance with the Data Privacy Act.

To validate and supplement the survey findings, the researcher conducted FGDs with twelve selected TLE teachers from Congressional District I. These discussions provided deeper insights into the implementation of contextualized teaching strategies, observed student technical skills, and the challenges encountered by teachers. The FGD was recorded, transcribed, and analyzed using thematic analysis to identify recurring patterns, themes, and categories that reflect the participants' experiences and perspectives, thereby enriching the interpretation of the quantitative survey data.

Data Analysis

In analyzing and interpreting the gathered data, the researcher employed quantitative techniques to ensure comprehensive, accurate, and reliable results. **Ranking** was used to identify the most significant technical skills, contextualized teaching strategies, and challenges as perceived by TLE teachers.

Weighted Mean was used to determine the level of technical skills demonstrated by junior high school students across four skill areas such as tool and equipment handling, mensuration and calculation, occupational safety and health practices, and ICT operations. It also assess the extent of utilization of contextualized teaching strategies in TLE, based on four dimensions: real-world relevance, learner responsiveness, and community engagement.

Additionally, it measures the degree of challenges encountered by teachers in implementing contextualized instruction while **Composite Mean.** was used to calculate the overall technical skills of students by aggregating the weighted means across all four skills areas. Similarly, this study determined the overall extent of utilization of contextualized teaching strategies by combining the weighted means of the three dimensions and summarized the overall intensity of challenges faced by teachers in implementing contextualized teaching strategies in TLE.

And lastly**, Pearson's r Correlation Coefficient.** This statistical tool was used to examine the relationship between level of students' technical skills and the extent of utilization of contextualized teaching strategies, and to assess the significance of these relationships.

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3. Results

Section 1: Level of Technical Skills Demonstrated by Junior High School Students in Technology and Livelihood Education (TLE)

In an era where technical skills are highly required, the delivery of Technology and Livelihood Education stands a cornerstone in delivering the curriculum. The researcher assessed the technical skills of students in junior high school in Congressional District I, SDO Batangas Province in four competency areas namely; tools and equipment handling, mensuration and calculation, occupational safety and health practices and basic programming and ICT operations.

1.1Tools and Equipment Handling

Table 1 shows the assessment of the level of technical skills demonstrated by the junior high school students as assessed by the teachers in terms of tools and equipment handling. This refers to the ability to identify, use, maintain, and store tools and equipment properly and safely (TESDA, 2022). In addition, it pertains to students' proficiency in operating tools relevant to their TLE specialization, such as kitchen utensils, carpentry tools, or ICT devices.

Table 1
Assessment on the Level of Technical Skills in terms of Tools and Equipment Handling

Indicators **My students can…**		**Weighted Mean**	**Verbal Interpretation**	**Rank**
1.	correctly identify different tools and equipment used in TLE	3.46	AA	1
2.	Describe the functions and proper uses of tools and equipment.	3.30	AA	5.5
3.	demonstrate the correct procedures in preparing tools and equipment before use.	3.43	AA	2.5
4.	handle and operate tools and equipment safely following standard operating procedures	3.43	AA	2.5
5.	observe occupational safety and health practices while using tools and equipment.	3.20	AA	9
6.	check, calibrate, or test tools and equipment before and after use to ensure accuracy.	3.38	AA	4
7.	perform preventive maintenance such as cleaning, lubricating, or storing tools properly.	3.18	AA	10
8.	identify and troubleshoot common problems encountered in using tools and equipment.	3.21	AA	8
9.	demonstrate efficiency in using tools and equipment to complete assigned tasks.	3.30	AA	5.5
10.	evaluate whether tools and equipment are appropriate and safe for specific tasks	3.23	AA	7
	Composite Mean	**3.31**	**AA**	

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Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Low(L) 1.50-2.49 Below Average (BA) 2.50-3.49-Above Average (AA) 3.50-4.00-High-(H)

Based on the study, the technical skills demonstrated by the students in junior high school about tool and equipment handling, reflect that the students are Above Average that shows knowledge and minimal competencies in performing TLE tasks. This insight encourages the researcher to teach better to develop the students' tools and equipment handling.

The data in Table 1 on tools and equipment handling reveals that the highest rated competency among junior high school students in TLE is their ability to correctly identify different tools and equipment with a weighted mean of 3.46 and a verbal interpretation of Above Average. This was followed by their capacity to demonstrate correct procedures in preparing tools and equipment before use and their ability to handle and operate tools safely, both with a weighted mean of 3.43. On the other hand, the troubleshooting common problems scored 3.21, ranked eighth. Observing occupational safety and health practices with a weighted mean of 3.20, and preventive maintenance such as cleaning and storing tools properly scored lowest with a mean of 3.18 with verbal interpretation of Above Average.

Despite variations in ranking, all competencies received Above Average interpretation, with a composite mean of 3.31, indicating overall strong technical skills in tool and equipment handling. These results suggest that while students excel in identification, preparation, and safe handling, this shows relative weaknesses in preventive maintenance and consistent application of occupational safety practices. This aligns with Villanueva, et. al., (2023) who found moderate proficiency among Batangas students but noted gaps in maintenance knowledge due to limited exposure to updated equipment. Similarly, Morales et. al. (2021), observed inconsistencies between skill acquisition and practice, influenced by motivation and resources, while Ogoc (2024) emphasized the role of teacher competence in shaping both technical skills and work values. Putri et. al., (2023) further highlighted that contextualized instruction enhances confidence and precision in tool handling, bridging theory and practice. Collectively, these findings underscore that while junior high learners demonstrate commendable technical skills in TLE, sustained improvement requires stronger emphasis on preventive maintenance, occupational safety, and contextualized hands-on learning curriculum DepEd (2024).

1.2 Mensuration and Calculation

Table 2 shows the assessment on the level of technical skills demonstrated by the students as assessed by the teacher in terms of mensuration and calculation. It involves measuring dimensions, quantities, and costs using appropriate tools and mathematical operations (DepEd, 2024). In this study, it refers to students' ability to perform accurate measurements and computations in practical tasks such as layout planning, budgeting, and material estimation.

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Table 2
Assessment on the Level of Technical Skills in terms of Mensuration and Calculation Skills
Legend: WM-Weighted Mean VI-Verbal Interpretation

Indicators **My students can…**		**Weighted Mean**	**Verbal Interpretation**	**Rank**
1.	identify and use appropriate measuring tools (e.g., ruler, tape measure, caliper, weighing scale) accurately.	3.33	AA	1
2.	read and record measurements correctly using both English and metric systems.	3.23	AA	4.5
3.	convert measurements from one unit to another (e.g., inches to centimeters, grams to kilograms).	3.30	AA	2
4.	perform basic mathematical calculations such as addition, subtraction, multiplication, and division in solving TLE tasks.	3.15	AA	9
5.	apply formulas in calculating area, volume, weight, and other dimensions relevant to TLE activities.	3.18	AA	6.5
6.	estimate quantities of materials needed for a given project accurately.	3.14	AA	10
7.	solve word problems involving measurement and computation related to TLE tasks.	3.18	AA	6.5
8.	check and verify the accuracy of measurements and calculations to minimize errors.	3.26	AA	3
9.	interpret numerical data, graphs, or tables to support problem-solving in TLE.	3.18	AA	6.5
10	apply mensuration and calculation skills in real-life and industry-related TLE activities.	3.23	AA	4.5
	Composite Mean	**3.22**	**AA**	

1.00-1.49 Low(L) 1.50-2.49 Below Average (BA) 2.50-3.49-Above Average (AA) 3.50-4.00-High-(H)

The researcher observed that the students in junior high school show above average skills in mensuration and calculation skills. This revealed that the foundation skills or problem solving need to be addressed for better higher order thinking skills or problem-solving skills. This insight encourages the researcher to enhance my contextualized teaching to improve the accuracy and confidence of the students in junior high schools, especially in Congressional District I.

The data in Table 2 on mensuration and calculation skills shows that the highest rated competency among junior high school students in TLE is their ability to identify and use appropriate measuring tools accurately, with a weighted mean of 3.33 and a verbal interpretation of Above Average. This is followed by their skill in converting measurements from one unit to another with a weighted mean of 3.30 and checking and verifying accuracy of measurements and calculations with 3.26, ranked third. Applying formulas in calculating dimensions, solving word problems, and interpreting numerical

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data all scored 3.18, ranked seventh. Performing basic mathematical calculations scored 3.15, ranked ninth, while estimating quantities of materials needed for projects scored lowest with 3.14, ranked tenth with verbal interpretation of Above Average. Despite these variations, all competencies were rated Above Average, indicating strong performance overall, with the composite mean reflecting consistent proficiency.

The analysis suggests that students excel in basic identification, conversion, and verification tasks but show relative weaknesses in estimation, application of formulas, and solving contextualized problems, which are critical for industry-related tasks. This finding resonates with Loquias et. al., (2024) who reported that students often struggled with applying mathematical operations in practical contexts due to weak numeracy foundations and lack of integrated math-TLE instruction. Rahman et al. (2022) demonstrated that project-based learning improved measurement accuracy and problem-solving, highlighting the importance of experiential approaches.

Meanwhile, Li et. al., (2023) highlighted that students exposed to culturally sensitive and industry-aligned instruction demonstrated stronger performance in mensuration and calculation, supporting the integration of localized content and real-world simulations in TLE. Flores et. al., (2023) found that blended teaching modalities such as video demonstrations and modular activities helped connect theoretical content with practical applications, while Abapo (2024) introduced the Contextualized Teacher's Instructional Plan which aligned competencies with TESDA standards and significantly improved industry-relevant performance. Cheng, et.al., (2025) emphasized that curriculum redesign and industry partnerships enhance the real-world relevance of vocational education.

Collectively, these studies emphasize that while junior high schools' students demonstrate commendable mensuration and calculation skills, sustained improvement requires integration of math with TLE, project-based learning, and immersive technologies to strengthen estimation, application, and interpretation competencies essential for real-world vocational demands.

1.3 Occupational Safety and Health Practices

Table 3 shows the assessment on the level of technical skills demonstrated by the junior high students as assessed by the teachers in Congressional District I, SDO Batangas Province in terms of occupational safety and health practices. To ensure a safe and effective learning environment in Technology and Livelihood Education, it is essential to examine how students adhere to occupational safety and health practices, as these competencies not only safeguard learners during practical activities but also prepare them for industry standards and workplace requirements.

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Table 3
Assessment of the Level of Technical Skills in terms of occupational safety and health practices

Indicators My students can…		Weighted Mean	Verbal Interpretation	Rank
1	identify safety signs, symbols, and hazard warnings in the workplace.	3.54	H	2
2	demonstrate proper use of personal protective equipment (PPE).	3.58	H	1
3	observe correct procedures in handling, operating, and storing tools and equipment safely.	3.48	AA	3
4	apply first-aid measures in case of minor accidents or injuries.	3.40	AA	6
5	maintain cleanliness and orderliness in the work area following the 5S of good housekeeping.	3.43	AA	5
6	identify potential risks or hazards in the work environment.	3.36	AA	10
7	allow emergency procedures and evacuation protocols.	3.38	AA	8.5
8	dispose of waste materials properly, including hazardous and recyclable waste.	3.38	AA	8.5
9	participate in promoting a safe and healthy learning/work environment.	3.46	AA	4
10	can comply with occupational safety and health standards aligned with industry practices.	3.39	AA	7
	Composite Mean	**3.44**	**AA**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Low(L) 1.50-2.49 Below Average (BA) 2.50-3.49-Above Average (AA) 3.50-4.00-High-(H)

The researcher observed that the students in junior high school show an Above Average level in terms of occupational safety and health practices. Also, the researcher believed that as a teacher there is a need to give more emphasis on hazard identification and preventive practices instruction. This insight encourages the researcher to enhance contextualized teaching strategies that promote a safer and responsible learning environment for the students.

The data in Table 3 on occupational safety and health practices shows that the highest-rated competency among junior high school students in TLE is their ability to demonstrate proper use of personal protective equipment with a weighted mean of 3.58 and a verbal interpretation of High. This is followed by identifying safety signs, symbols, and hazard warnings with 3.54, and observing correct procedures in handling and storing tools safely with 3.48, ranked third. On the other hand, both following emergency procedures and evacuation protocols and proper waste disposal tied with the score 3.38, ranked eighth and nine. Also, identifying potential risks or hazards scored lowest with 3.36,

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ranked tenth. Despite these variations, all competencies were rated Above Average to High, with a composite mean of 3.44, indicating strong but not flawless adherence to occupational safety practices.

The analysis suggests that while students excel in PPE usage and hazard recognition, students show relative weaknesses in risk identification, emergency response, and consistent application of safety standards, which are critical for workplace readiness. Bautista (2021) noted that students often neglected proper procedures during hands-on activities despite awareness of safety protocols, linking this to insufficient reinforcement and lack of structured drills. DepEd's Learning Action Cell sessions in 2023 emphasized integrating DOLE-based safety modules to improve compliance and awareness, underscoring the importance of institutional support. These findings highlight that while junior high students demonstrate commendable occupational safety skills, sustained improvement requires structured reinforcement, regular safety drills, and integration of industry-aligned modules to ensure consistent application of safety practices in both school and workplace contexts.

In Quezon City, Basal (2022) found that students performed better in occupational safety and health practices when teachers integrated DOLE-based safety modules and reinforced protocols during practical sessions. Internationally, Carruthers et.al. (2020) showed that contextualized vocational instruction improved early career outcomes and technical skill acquisition among middle school learners in the United States, stressing the importance of tailoring instruction to occupational contexts which enhanced tool handling and ICT proficiency. Together, these findings highlight that strengthening safety practices through structured reinforcement and aligning instruction with occupational contexts are both essential for improving technical competencies and preparing junior high students for workplace readiness.

1.4 Basic Programming and ICT Operations

Table 4 shows the assessment on the level of technical skills demonstrated by the junior high students as assessed by the teachers in Congressional District I, SDO Batangas Province in terms of basic programming and ICT operations. In today's technology-driven environment, the integration of basic programming and ICT operations in TLE is vital for equipping students with digital literacy and problem-solving skills that are essential both in academic tasks and future workplace demands.

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Table 4
Assessment of the Level of Technical Skills in terms of basic programming and ICT operations

Indicators My students can…		Weighted Mean	Verbal Interpretation	Rank
1	identify the basic parts and functions of a computer system	3.20	AA	2
2	demonstrate basic operations such as file management, typing, and using productivity tools (e.g., Word, Excel, PowerPoint).	3.06	AA	5
3	apply proper keyboarding techniques for efficiency.	2.94	AA	7
4	use the internet responsibly for research and communication.	3.15	AA	3.5
5	understand and use basic programming concepts (e.g., variables, loops, conditionals).	3.15	AA	3.5
6	write, test, and debug simple programs using an introductory programming language	2.79	AA	8
7	create simple algorithms to solve problems or perform tasks.	2.70	AA	9
8	apply ICT skills in creating outputs/projects aligned with TLE.	2.69	AA	10
9	practice safe and ethical use of ICT (e.g., digital citizenship, data privacy, cybersecurity).	3.24	AA	1
10	integrate basic programming and ICT operations into real-world or industry-related applications.	2.97	AA	6
	Composite Mean	**2.99**	**AA**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Low(L) 1.50-2.49Below Average (BA) 2.50-3.49-Above Average (AA) 3.50-4.00-High-(H)

The researcher observed that the students in junior high school in Congressional District I, show Above Average skills in performing the basic programming and ICT operations, although it is Above Average it is clearly shown that this competency is the lowest among the four areas. As a teacher it encourages us to enhance contextualized teaching strategies that respond to their specific needs especially in applying ICT skills in creating outputs or projects.

The data in Table 5 on basic programming and ICT operations shows that the highest-rated competency among junior high school students in TLE is their ability to practice safe and ethical use of ICT, with a weighted mean of 3.24 and a verbal interpretation of Above Average, ranked first. This is followed by identifying the basic parts and functions of a computer system with 3.20, and both using the internet responsibly and understanding basic programming concepts with 3.15, ranked third. On the other side, writing and debugging simple programs scored 2.79, ranked eighth, creating simple

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algorithms scored 2.70, ranked ninth, and applying ICT skills in creating outputs aligned with TLE scored lowest with 2.69, ranked tenth with verbal interpretation of Above Average.

Despite these variations, all competencies were rated Above Average, with the composite mean of 2.99 reflecting consistent but moderate proficiency. The analysis indicates that students excel in ICT ethics, basic computer knowledge, and responsible internet use, yet show weaknesses in programming, algorithm creation, and project-based ICT applications, which are essential for employability readiness in a digital economy. Tarasina (2025) reported that limited internet connectivity in Philippine public schools restricted exposure to digital tools, resulting in stronger performance in basic tasks but weaker skills in coding and troubleshooting. The National Center for Career and Technical Education 2023 found that early exposure to coding programs in the United States enhanced ICT skills and problem-solving abilities, underscoring the importance of integrating digital literacy early. Cabansag-Curan (2024) emphasized that contextualized instruction and adequate materials improved engagement and performance.

TESDA (2025) introduced ASIS to streamline competency evaluation, but gaps in Junior High implementation limited immersion opportunities. Calanog et.al. (2021) highlighted that the pandemic disrupted hands-on learning, reducing mastery, while Chokkalingam (2021) and Villanueva (2023) stressed the importance of teacher specialization in improving student outcomes. Collectively, these findings suggest that while Junior High learners demonstrate commendable ICT and basic programming skills, sustained improvement requires stronger infrastructure, contextualized instruction, immersive digital tools, and specialized teacher deployment to ensure readiness for industry-aligned digital competencies.

Section 2. Extent of Utilization of Contextualized Teaching Strategies In TLE

This part of research presents an assessment on the extent of utilization of contextualized teaching strategies in Technology and Livelihood Education focusing on three competencies namely; relevance to real world application, responsive to learners need and promote community engagement. These results show insights into how teachers employ contextualization into their everyday teaching methods.

2.1 Relevance to Real-World Applications

Table 5 shows the assessment of the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of relevance to real world application. Relevance to real-world applications in contextualized TLE instruction underscores the importance of linking classroom learning with authentic industry practices, workplace tasks, and everyday experiences, thereby enabling students to develop practical competencies that prepare them for future careers and livelihood opportunities.

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Table 5
Assessment of the extent of utilization of contextualized strategies in terms of Relevance to Real-World Applications

Indicators As TLE teacher, I…		Weighted Mean	Verbal Interpretation	Rank
1	connect lessons to real-life situations and work-related tasks.	3.80	HU	1
2	use actual tools, equipment, and materials similar to those used in industries.	3.79	HU	2
3	integrate case studies, scenarios, or simulations that reflect real-world problems.	3.70	HU	4.5
4	allow students to apply TLE knowledge and skills in solving practical issues.	3.70	HU	4.5
5	provide hands-on activities that mirror actual workplace practices.	3.72	HU	3
6	incorporate local industry visits, field trips, or work immersion in TLE instruction.	3.64	HU	6
7	use contextual examples from local trades, businesses, or occupations.	3.61	HU	8
8	simulate workplace scenarios to strengthen problem-solving and critical thinking.	3.41	HU	10
9	require project outputs that resemble industry-based products or services.	3.62	HU	7
10	integrate entrepreneurial tasks aligned with community livelihood practices.	3.60	HU	9
	Composite Mean	**3.66**	**HU**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Least Utilize (LU) 1.50-2.49-Slightly Utilized (SU) 2.50-3.49-Moderately Utilized (MU) 3.50-4.00-Highly Utilized-(HU)

The researcher observed from the contextualized teaching strategies employed by the TLE teachers, the use of real-world application which shows a high composite mean of 3.66 with an interpretation of Highly Utilized. It reflects that using a real-world application shows that there is a need to focus on simulating workplace scenarios to strengthen problem solving and critical thinking of our students.

The data in Table 5 on relevance to real-world applications shows that the most Highly Utilized contextualized instructional strategy among junior high school students in TLE is connecting lessons to real-life situations and work-related tasks with a weighted mean of 3.80, ranked first. This is followed by using actual tools, equipment, and materials like those in industries with a mean of 3.79 and providing hands-on activities that mirror workplace practices with the mean of 3.72. On the other hand, using contextual examples from local trades scored 3.61, ranked eighth. Integrating entrepreneurial tasks aligned with community livelihood practices scored 3.60, ranked ninth, while simulating workplace scenarios to strengthen problem-solving scored lowest with 3.41.

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All strategies were rated Highly Utilized, with a composite mean of 3.66, indicating strong integration of real-world relevance in TLE instruction. The analysis suggests that students benefit most from strategies directly linking lessons to authentic tasks and industry tools, while simulation-based approaches and entrepreneurial integration are less emphasized but still valuable. According to Xingfeng (2025) vocational education frameworks in China were adapted to globally oriented learners through bilingual instruction and modular training programs, enabling flexible learning pathways and enhancing cross-cultural competence. Training programs and industry-education alliances ensured workforce readiness among vocational graduates. Morales et.al., (2021) further emphasized that students' application of technical knowledge improves significantly when instruction is tailored to real-world contexts.

Collectively, these findings highlight that while contextualized strategies are highly utilized, sustained improvement requires systemic support, specialized teacher deployment, stronger industry immersion, and internationally relevant instructional approaches to ensure that Junior High learners develop technical competencies, employability readiness, and adaptability aligned with both local and global applications.

2.2 Specific Learners' Need

Table 6 shows the assessment on the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of specific to learners need. Addressing specific learners' needs in contextualized TLE instruction emphasized the importance of adapting teaching strategies to accommodate diverse abilities, comprehension levels, and socioeconomic backgrounds, ensuring that all s`tudents are provided with equitable opportunities to succeed in both academic and practical tasks.

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Table 6
Assessment of the extent of utilization of contextualized strategies in terms of Specific Learners' Needs

Indicators As TLE teachers, I…		Weighted Mean	Verbal Interpretation	Rank
1.	designed the lessons to match the learning styles and abilities of students.	3.72	HU	3.5
2.	address the diverse backgrounds and interests of learners.	3.67	HU	6.5
3.	provide differentiated tasks to cater to slow, average, and advanced learners.	3.74	HU	1.5
4.	incorporate learner-centered approaches to foster active participation.	3.67	HU	6.5
5.	provide opportunities for students to showcase their individual strengths.	3.70	HU	5
6.	integrate remedial activities for struggling learners to master skills.	3.74	HU	1.5
7.	provide enrichment activities for fast learners to maximize their potential.	3.72	HU	3.5
8.	utilize teaching aids and multimedia tailored to students' comprehension levels.	3.62	HU	9.5
9.	consider learners' socioeconomic backgrounds when assigning tasks.	3.62	HU	9.5
10.	use individualized feedback and mentoring to address unique learning needs.	3.67	HU	6.5
	Composite Mean	**3.69**	**HU**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Least Utilize (LU) 1.50-2.49-Slightly Utilized (SU) 2.50-3.49-Moderately Utilized (MU) 3.50-4.00-Highly Utilized-(HU)

The researcher noticed that the contextualized teaching strategies that are mostly used by the teachers are the respondents to the specific to the learners' needs in delivering the curriculum. As a teacher it is important to address the students' needs in delivering the curriculum, especially in utilizing the teaching aids and multimedia which is tailored to students' comprehension level and by considering the socio-economic background of the students.

The data in Table 6 on specific learners' needs shows that the most Highly Utilized contextualized instructional strategies among Junior High School students in TLE are providing differentiated tasks to cater slow, average, and advanced learners and integrate remedial activities for struggling learners, both with a weighted mean of 3.74. This was followed by designing strategies to match learning styles and abilities and providing enrichment activities for fast learners with a mean of 3.72, while addressing diverse backgrounds and interests, incorporating learner-centered approaches, and using individualized feedback and mentoring all scored 3.67. Utilizing teaching aids and multimedia

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tailored to comprehension levels and considering learners' socioeconomic backgrounds both scored lowest with a mean of 3.62. and despite these variations, all strategies were rated Highly Utilized, with a composite mean of 3.69, indicating strong responsiveness to diverse learner needs in TLE instruction. The analysis suggests that teachers prioritize differentiated instruction and remedial support to ensure inclusivity, while strategies addressing socioeconomic contexts and multimedia adaptation are less emphasized but remain important.

According to Cabansag-Curan (2024), students showed greater motivation and skill development in exploratory TLE courses when teachers had adequate materials and contextualized instruction, particularly in mensuration and ICT operations. Ricardez (2024) demonstrated that multisensory contextualized materials effectively supported learners with difficulties by engaging multiple senses and connecting lessons to real-life contexts, thereby enhancing comprehension, confidence, and inclusivity. Abapo (2024) noted that the Contextualized Teacher's Instructional Plan enabled teachers to personalize instruction according to learners' interests, styles, and needs, fostering engagement, motivation, and equitable opportunities for success. Collectively, these findings emphasize that while contextualized strategies for specific learners' needs are highly utilized, sustained improvement requires continuous integration of personalized, multisensory, and resource-supported approaches to ensure that Junior High learners develop both technical competencies and adaptive skills essential for real-world success.

2.3 Promotion of Community Engagement

Table 7 shows the assessment on the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of promotion of community engagement, contextualized teaching strategies highlights the role of linking classroom learning with local livelihood programs, trades, and civic-oriented activities, thereby fostering students' sense of responsibility, collaboration, and active participation in community development.

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Table 7
Assessment on the extent of utilization of contextualized strategies in terms of Promotion of Community Engagement

Indicators As TLE teacher, I…		Weighted Mean	Verbal Interpretation	Rank
1.	involve local community members as resource people in TLE classes.	3.55	HU	6.5
2.	use local raw materials and resources in teaching-learning activities.	3.65	HU	2
3.	integrate community-based problems or needs in class projects.	3.59	HU	4
4.	encourage learners to participate in livelihood projects or community services.	3.54	HU	8
5.	strengthen partnerships between schools, families, and industries in the locality.	3.57	HU	5
6.	integrate indigenous knowledge and local practices into classroom discussions.	3.60	HU	3
7.	involve learners in school-based livelihood programs that address community needs.	3.69	HU	1
8.	highlight success stories of community entrepreneurs as learning examples.	3.55	HU	6.5
9.	promote civic responsibility through service-learning activities.	3.51	HU	10
10.	encourage collaboration with local organizations, cooperatives, and barangays.	3.53	HU	9
	Composite Mean	**3.58**	**HU**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49 Least Utilize (LU) 1.50-2.49-Slightly Utilized (SU) 2.50-3.49-Moderately Utilized (MU) 3.50-4.00-Highly Utilized-(HU

The researcher noticed on the extent of contextualized teaching strategies are Highly Utilized here in Congressional District I by the teachers especially in the area of promotion of community engagement which is suited among students nowadays, the researcher encourages the teachers in collaboration of delivering the curriculum with local organization in community and by promoting civic responsibility through service learning activities.

The data in Table 7 on promotion of community engagement shows that the most highly utilized contextualized instructional strategy among junior high school students in TLE was involving learners in school-based livelihood programs that address community needs with a weighted mean of 3.69, ranked first. This was followed by using local raw materials and resources in teaching-learning activities with a mean of 3.65 and integrating indigenous knowledge and local practices into classroom discussions with a mean of 3.60. The least observed is encouragement to the learners to participate in livelihood projects or community services with score of 3.54 followed by the collaboration with local

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organizations with a mean of 3.53, ranked ninth, and promoting civic responsibility through service-learning activities scored lowest with 3.51. Despite these variations, all strategies were rated Highly Utilized, with a composite mean of 3.58, indicating strong integration of community engagement in TLE instruction.

The analysis suggests that learners benefit most from direct involvement in livelihood programs and the use of local resources, while civic responsibility and collaboration with organizations, though still highly utilized, are less emphasized. Flores et al (2023) found that blended teaching modalities such as video demonstrations and modular activities helped connect theoretical content with practical applications, reinforcing the importance of community-linked instruction.

Abapo (2024) introduced the Contextualized Teacher's Instructional Plan which aligned competencies with TESDA standards and significantly improved learners' performance in industry-relevant tasks. Cheng et.al. (2025) emphasized that curriculum redesign and industry partnerships enhance the real-world relevance of vocational education, underscoring the importance of community engagement strategies. Collectively, these findings highlight that while contextualized strategies for community engagement are highly utilized, sustained improvement requires stronger partnerships, structured civic programs, and integration of local practices to ensure that Junior High learners develop technical competencies, social responsibility, and employability readiness aligned with community and industry needs.

Section 3: Relationship Between the Assessments on The Level of Technical Skills of the Students in TLE and On the Extent of Utilization of Contextualized Instructional Strategies

3.1 Real World Application

Table 8 shows the assessment on the level of technical skills of students in Technology and Livelihood Education and on the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of real-world application. Examining the relationship between students' technical skills in TLE and the extent of contextualized instructional strategies provides valuable insight into how teaching approaches directly influence learners' competencies, highlighting the interconnectedness of skill development and instructional relevance.

Table 8
Assessments on Level of Technical Skills and on the Extent of Contextualized Strategies in Terms of Relevance to Real-World Applications

Variables	Computed *r*-Value	*p*-Value	Decision	Remarks
1. Tool and Equipment Handling	0.44	<0.001	Reject Ho	Significant
2. Mensuration and Calculation	0.35	<0.001	Reject Ho	Significant
3. Occupational Safety and Health Practices	0.39	<0.001	Reject Ho	Significant
4. Basic Programming and ICT Operations	0.48	<0.001	Reject Ho	Significant

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The researcher observed the positive relationship between the level of technical skills of junior high school students and the relevance to real world application. Where real-life activities play a vital role to easily understand the delivery of curriculum to the students.

As shown in Table 8, the correlation analysis revealed significant positive relationships between students' technical skills in TLE and the extent of utilization of contextualized instructional strategies relevant to real-world applications. Specifically, tool and equipment handling was moderately correlated with contextualized strategies ($r = .44$, $p < .001$), while mensuration and calculation demonstrated a weaker yet significant correlation ($r = .35$, $p < .001$). Occupational safety and health practices also showed a moderate correlation ($r = .39$, $p < .001$). The strongest relationship was observed in basic programming and ICT operations ($r = .48$, $p < .001$). These findings indicate that contextualized instructional strategies are significantly associated with the enhancement of students' technical competencies, particularly in areas requiring digital literacy and practical tool usage. The rejection of the null hypothesis across all variables confirms that embedding real-world relevance into instructional practices contributes meaningfully to skill development in TLE.

These findings are consistent with Morales et.al. (2021) who emphasized that students' application of technical knowledge improves significantly when instruction is tailored to real-world contexts. Xingfeng et. al. (2025) further demonstrated how vocational education frameworks in China were adapted to globally oriented learners through bilingual instruction and modular training programs, enabling flexible learning pathways and enhancing cross-cultural competence. Collectively, these studies affirm that contextualized TLE instruction when designed to reflect real world tasks, learner diversity, community involvement, and industry standards not only strengthens technical competencies but also prepares junior high students for employment, entrepreneurship, and lifelong learning, highlighting the importance of systemic support, specialized teacher deployment, and stronger industry immersion in sustaining skill development.

3.2 Specific Leaners Need

`Table 9 shows the assessment of the level of technical skills of students in Technology and Livelihood Education and the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of real-world application.

Table 9
Assessments on Level of Technical Skills and on the Extent of Contextualized Strategies in Terms of Specific Learners' Needs

Variables	Computed *r*-Value	*p*-Value	Decision	Remarks
1. Tool and Equipment Handling	0.52	<0.001	Reject Ho	Significant
2. Mensuration and Calculation	0.41	<0.001	Reject Ho	Significant
3. Occupational Safety and Health Practices	0.50	<0.001	Reject Ho	Significant
4. Basic Programming and ICT Operations	0.51	<0.001	Reject Ho	Significant

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The researcher observed that there is a significant relationship between the technical skills of junior high school students and the specific learners needs, especially when it is tailored to the specific needs of students such as specific background through this, their technical skills mastery improves significantly.

As presented in Table 9, significant positive correlations were found between students' technical skills in TLE and the extent of utilization of contextualized instructional strategies that address specific learners' needs. Tool and equipment handling demonstrated the strongest correlation ($r = .52$, $p < .001$), followed closely by basic programming and ICT operations ($r = .51$, $p < .001$). Occupational safety and health practices also showed a strong correlation ($r = .50$, $p < .001$), while mensuration and calculation yielded the lowest yet still significant correlation ($r = .41$, $p < .001$). These results indicate that learner-centered contextualization is significantly associated with the enhancement of technical competencies, particularly in areas requiring practical application, digital literacy, and safety awareness. The rejection of the null hypothesis across all variables confirms that tailoring instructional strategies to specific learners' needs meaningfully supports skill acquisition in TLE.

According to Cabansag-Curan (2024) students demonstrated greater motivation and skill development in exploratory TLE courses when teachers had adequate materials and contextualized instruction, especially in mensuration and ICT operations. Ricardez (2024) highlighted those multisensory contextualized materials effectively supported learners with difficulties by engaging in multiple senses and connecting lessons to real-life contexts, thereby improving comprehension, confidence, and inclusivity. Abapo (2024) emphasized that the Contextualized Teacher's Instructional Plan allowed teachers to personalize instruction according to learners' interests and abilities, fostering engagement, motivation, and equitable opportunities for success. Collectively, these findings affirm that contextualized strategies tailored to specific learners' needs not only strengthen technical skills but also promote inclusivity, confidence, and adaptability, ensuring that Junior High learners are better prepared for real-world challenges and future employability.

3.3 Promotion of Community Engagement

Table 10 shows the assessment of the level of technical skills of students in Technology and Livelihood Education and the extent of utilization of contextualized teaching strategies employed by the TLE teachers in Congressional District I, SDO Batangas Province in terms of promotion of community engagement.

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Table 10
Assessments on Level of Technical Skills and on the Extent of Contextualized Strategies in Terms of Promotion of Community Engagement

Variables	Computed *r*-Value	*p*-Value	Decision	Remarks
1. Tool and Equipment Handling	0.47	<0.001	Reject Ho	Significant
2. Mensuration and Calculation	0.27	<0.001	Reject Ho	Significant
3. Occupational Safety and Health Practices	0.32	<0.001	Reject Ho	Significant
4. Basic Programming and ICT Operations	0.47	<0.001	Reject Ho	Significant

The researcher observed that technical skills are statistically significant, because it shows that connecting my students to our local community here in Congressional District I, SDO Batangas Province fosters a sense of responsibility that helps them to translate the curriculum into better performance tasks in TLE.

As shown in Table 10, significant positive correlations were found between students' technical skills in TLE and the extent of utilization of contextualized instructional strategies that promote community engagement. Tool and equipment handling ($r = .47$, $p < .001$) and basic programming and ICT operations ($r = .47$, $p < .001$) demonstrated the strongest correlations, indicating that community-oriented strategies are particularly effective in enhancing practical and technological competencies. Occupational safety and health practices showed a modest correlation ($r = .32$, $p < .001$), while mensuration and calculation yielded the lowest yet still significant correlation ($r = .27$, $p < .001$). These results suggest that embedding community engagement into instructional practices meaningfully supports skill acquisition, particularly in applied and ICT-related domains, while computational and safety skills may require complementary instructional approaches.

These findings align with Flores et al (2023) who found that blended teaching modalities helped connect theoretical content with practical applications, while Abapo (2024) emphasized that the Contextualized Teacher's Instructional Plan aligned competencies with TESDA standards and improved industry-relevant performance. Cheng, et. al., (2025) further highlighted that curriculum redesign and industry partnerships enhance the real-world relevance of vocational education, underscoring the importance of embedding community engagement into instructional practices. Collectively, these studies affirm that contextualized strategies rooted in community involvement not only strengthen technical competencies but also foster social responsibility, collaboration, and employability readiness among junior high school students.

Section 4: Challenges Encountered by teachers in implementing contextualized instruction in TLE

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Understanding the challenges encountered by teachers in implementing contextualized TLE instruction is crucial, as these difficulties directly affect the effectiveness of teaching strategies, the availability of resources, and the sustainability of industry-aligned practices in the classroom.

Table 11
Challenges Teachers Encounter in Implementing Contextualized Instructional Strategies

	Challenges	Weighted Mean	Verbal Interpretation	Rank
1.	Lack of sufficient teaching and learning materials contextualized to the local industry.	3.02	A	1
2.	Limited training and professional development opportunities in contextualized instruction.	2.97	A	2
3.	Difficulty in aligning TLE lessons with diverse learners' needs and abilities.	2.71	A	7
4.	Insufficient support from school administrators, parents, or the community.	2.65	A	9
5.	Limited access to updated tools, equipment, and technologies used in industries.	2.94	A	3
6.	Time constrains in preparing contextualized lesson plans and activities.	2.83	A	5
7.	Difficulty in integrating real-world and industry-based practice into classroom instruction.	2.77	A	6
8.	Lack of industry partnerships or linkages for contextualized learning opportunities.	2.87	A	4
9.	Learners lack motivation or readiness to engage in contextualized tasks.	2.70	A	8
10.	Difficulty in assessing students' performance in contextualized activities effectively.	2.61	A	10
	Composite Mean	**2.81**	**A**	

Legend: WM-Weighted Mean VI-Verbal Interpretation
1.00-1.49- Strongly Disagree (SD) 1.50-2.49 Disagree (D) 2.50-3.49-Agree (A) 3.50-4.00-Strongly Agree -(SA)

The researcher personally noticed the barriers that affect the effective way of delivering the curriculum. However, the success of our students is not solely dependent on the curriculum itself, but how we contextualized the curriculum to fit for our students.

The data in Table 11 on the challenges met by teachers in utilizing contextualized TLE instruction shows that the most pressing issue was the lack of sufficient teaching and learning materials contextualized to the local industry with a weighted mean of 3.02, ranked first. This was followed by limited training and professional development opportunities in contextualized instruction with 2.97,

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ranked second, and limited access to updated tools, equipment, and technologies with 2.94, ranked third. At the tail end of the ranking are learners' lack of motivation scored 2.70, ranked eighth. Insufficient support from administrators, parents, or the community scored 2.65, ranked ninth, while difficulty in assessing students' performance in contextualized activities scored lowest with 2.61, ranked tenth. Despite these variations, all indicators were rated Agree, with a composite mean of 2.81, indicating that teachers consistently face moderate challenges in implementing contextualized instruction.

The results of the FGD with selected TLE teachers further validated these findings. Respondents repeatedly emphasized resource scarcity as the most critical barrier, with one teacher stating, *"It's hard to contextualize lessons you do not master to teach, especially when materials are scarce and facilities are lacking."* Another respondent highlighted the lack of industry-standard tools and laboratories, noting, *"There are times that lessons can't be delivered successfully because the equipment is not available, so the activity becomes more theoretical than practical."* Teachers also pointed to time constraints and workload pressures, with one remarking, *"We can teach, but we cannot give what we don't have. Preparing contextualized materials takes time, and with heavy workloads, fatigue sets in."*

A recurring theme was the need for training and professional development, as several respondents admitted that *"some teachers are not fully trained in contextualization, making it hard to connect lessons to real situations."* Others stressed the challenge of student diversity and motivation, explaining that varying skill levels and interests make it difficult to design activities relevant to all learners. Collectively, these focus group discussions insights reinforce the survey results, confirming that teachers' ability to contextualize lessons is hindered by systemic resource shortages, insufficient training, limited industry linkages, and diverse learner needs.

These insights aligned with the literature. Manlangit (2025) emphasized that inconsistent access to industry-standard tools and insufficient hands-on training hinder effective implementation, while Barcelona et al. (2023) reported that educators often resort to personal funds and stakeholder support to address resource gaps. Golimlim (2023) highlighted the difficulty of adapting strategies to diverse learners in the new-normal learning environment, and Li et. al., (2020) advocated for competency-based education and employer partnerships to strengthen contextualization. Jobs for the Future (2023) recommended career-focused, project-based approaches to improve engagement, and Pirtheepal (2023) underscored the need for ongoing support and curriculum alignment.

Similarly, Abdelmalek (2023) introduced context-aware tools to assist teachers in overcoming instructional challenges.Taken together, the survey results, interview responses, and related literature confirm that while contextualized TLE instruction enhances student engagement and skill development, its effective implementation is constrained by systemic, pedagogical, and resource-related challenges. Addressing these issues requires coordinated efforts in teacher training, curriculum design, community collaboration, and technological support to maximize the impact of contextualized instruction.

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Section 5. Proposed Instructional Materials

Based on the results of the study particularly, on the level of technical skills demonstrated by junior high school students in TLE and the extent of utilization of contextualized teaching strategies in terms of relevance to real-world applications, specific learners' needs, and promotion of community engagement, as well as the identified relationship between technical skills and contextualized strategies and the challenges met by teachers, several instructional materials may be formulated to support contextualized TLE teaching.

These include industry-aligned learning modules that integrate TESDA competencies and DOLE-based safety standards to strengthen tool and equipment handling, mensuration and calculation, occupational safety and health practices, and basic programming and ICT operations a project-based activity workbooks that combine mensuration, calculation, and problem-solving tasks with real-world scenarios to enhance application and estimation skills; multisensory and differentiated instructional kits such as visual aids, interactive simulations, and augmented reality tools to address diverse learner needs and improve comprehension of technical drawings and spatial reasoning; community engagement manuals that guide teachers in designing livelihood projects, service-learning activities, and partnerships with local industries to connect classroom learning with community development; and digital learning resources including blended video demonstrations, modular activities, and context-aware software to support ICT integration and flexible learning pathways. These instructional materials may be complemented by teacher resource guides that provide strategies for contextualization, assessment rubrics for practical tasks, and time-efficient lesson planning templates. Collectively, such materials will address gaps in resources, training, and industry linkages while ensuring that TLE instruction remains relevant, inclusive, and responsive to both local and global workforce demands.

4. Discussion

Junior High School students in Technology and Livelihood Education (TLE) demonstrate an overall Above Average level of technical skills, but a clear gap exists between basic tasks and complex operations. In tool and equipment handling (Composite Mean = 3.31), mensuration and calculation (Composite Mean = 3.26), students excel at tool identification and safe use but struggle with preventive maintenance and higher-order mathematical material estimations. Occupational safety and health practices scored the highest (Composite Mean = 3.44) due to strict compliance with safety signs and Personal Protective Equipment (PPE); however, students lack proactive hazard identification skills. Basic programming and ICT operations scored the lowest (Composite Mean =

2.99), revealing that while students have strong digital literacy and safety habits, they face substantial challenges in applied coding, creating algorithms, and producing practical outputs.

Concurrently, TLE educators Highly Utilize contextualized teaching strategies, particularly in addressing learners' specific needs (Composite Mean = 3.69) and delivering real-world relevance (Composite Mean = 3.66). Teachers frequently link lessons to real-life industries and use differentiated activities, though they less frequently employ complex workplace simulations or align lessons with students' socioeconomic backgrounds. Community engagement is also highly utilized (Composite Mean = 3.58) through school livelihood programs, but formal civic service-learning remains lower. Pearson r correlation analysis confirmed a statistically significant positive relationship between a teacher's use of contextualized strategies and student technical performance across all domains. This successful pedagogy, however, is restricted by moderate implementation challenges (Composite Mean = 2.81). Teachers are primarily hindered by an absolute lack of localized learning materials, limited training in contextualization, and inadequate laboratory infrastructure gaps that directly justify the study's proposed illustrated manuals, applied ICT modules, and community project guides.

The discrepancy between strong conceptual recognition and weak practical execution observed in this study mirrors current technical-vocational literature. The decline in student performance regarding tool maintenance and complex machine calibration supports previous studies showing that exploratory TLE mastery is often bottlenecked by limited laboratory time and resource constraints. Similarly, students' computational difficulties during material estimation align with regional research indicating that mathematical applications trigger student anxiety when taught in isolation from direct hands-on workshop practices.

Furthermore, Above Average with explicit safety rules alongside low proactive risk diagnostics matches established safety data, which emphasizes that junior high school students remain responsive and rely heavily on teacher supervision instead of independently identifying hidden workplace hazards. Lastly, the systemic institutional barriers reported by the teachers namely resource scarcities, non-specialized teaching tracks, and the need to spend personal funds to contextualize generic learning guides confirm that a lack support and localized training compromises instructional effectiveness and pushes practical subjects toward theoretical teaching.

The significant positive correlation established in this study provides clear directions for educational practice and institutional policy. In the classroom, teachers must move away from generic, one-size-fits-all textbooks and actively utilize localized learning resources, while department heads must implement peer-coaching networks to support non-specialized teachers assigned to unfamiliar strands. At the policy level, the Schools Division Office (SDO) of Batangas Province should sponsor division-wide curriculum workshops to collaboratively write, validate, and distribute localized instructional modules, directly addressing the top-ranked challenge of material scarcity.

The findings of this study must be evaluated within its specific boundaries. Geographically, data collection was isolated strictly to public secondary schools within the seven municipalities of Congressional District I, SDO Batangas Province, meaning the results may not apply to private schools.

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Furthermore, the results are based entirely on the self-reported survey responses and perceptual ratings of 141 TLE teachers and selective TLE teachers for focus group discussions, because the research targeted the junior high school level, it did not track student outcomes or career choices as they transitioned into Senior High School TVL tracks.

5. Conclusion

Based on the findings of the study, conclusions were drawn:

1. The teachers' assessments showed that junior high school students in Technology and Livelihood Education demonstrated above average level of technical skills.
2. The teachers' self-assessments indicated high utilization of contextualized teaching strategies.
3. The assessments of the students' technical skills in Technology and Livelihood Education and on the extent of utilization of contextualized teaching strategies were found significantly related.
4. Teachers encountered moderate challenges in implementing contextualized teaching strategies mainly due to limited teaching and learning materials, limited training and professional development opportunities, and limited access to updated tools, equipment and technologies.
5. The proposed instructional materials on tool and equipment manuals, ICT and programming activity modules, and community-based project guides will effectively support contextualized TLE teaching by ensuring that instruction remains practical, learner-centered, and industry-relevant.

Recommendations

1. The proposed instructional materials may be used by teachers in Congressional District I, SDO Batangas Province
2. To strengthen students' overall proficiency in TLE, it is recommended to focus on preventive maintenance, estimation, hazard identification, and applied ICT programming so students can improve equipment care, problem-solving accuracy, safety awareness, and integration of digital skills into practical outputs.
3. It is recommended that contextualized teaching strategies in TLE be further strengthened by enhancing workplace simulation activities and tailoring instructional materials to learners' socioeconomic contexts and comprehension levels, ensuring that instruction remains highly relevant, inclusive, and responsive to diverse student needs.
4. It is recommended to address the moderate challenges being experienced by the teachers in contextualized TLE instruction by providing stronger systemic support through adequate resources, training, and industry linkages, complemented by the use of tool and equipment manuals, ICT activity modules, and community-based project guides to ensure instruction remains practical, learner-centered, and industry-relevant.

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