Techniques And Strategies Employed by Technology and Livelihood Education (TLE) Teachers in Classroom Instruction: A Proposed Pedagogical Training Framework

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ABSTRACT

This study explored the instructional techniques and strategies employed by Technology and Livelihood Education (TLE) teachers and the challenges they encountered in teaching specialized subjects at Lamo National High School, Nueva Vizcaya, Philippines. A qualitative descriptive design was used. Data were gathered from seven purposively selected, tenured TLE teachers specializing in Industrial Education and Home Economics through individual interviews using a validated structured interview guide, and the transcripts were analyzed through open and axial coding, from which themes were developed. Teachers reported collaborative and student-centered learning, ICT integration and interactive instruction, and instructional preparedness as their main strategies. They described classroom management and environmental conditions, time management, and safety and learner welfare concerns as their main challenges. The six themes were consolidated into five training areas, and a pedagogical training framework was proposed from them. The framework specifies objectives, competency areas, five training modules, delivery strategies, implementation arrangements, and evaluation indicators. Because the framework rests on teachers' self-reports from one school and has not yet been validated or piloted, the study recommends expert validation and a pilot evaluation as the next research phase.

Keywords: Technology and Livelihood Education, instructional strategies, teaching challenges, pedagogical training framework, qualitative descriptive study, teacher professional development

INTRODUCTION

The Technology and Livelihood Education (TLE) component of the Philippine K–12 curriculum, implemented by the Department of Education (DepEd) in 2013 under the Enhanced Basic Education Act (Republic of the Philippines, 2013), serves as a cornerstone of technical-vocational preparation in secondary education. Designed to cultivate job-ready skills, TLE encompasses a wide array of specializations including industrial arts, computer system servicing, food processing, beauty care, tailoring, and animal production. This multifaceted domain is intended to equip learners with practical competencies aligned with local labor market demands and national development goals.

Research on TLE and technical-vocational-livelihood (TVL) instruction in the Philippines has grown in recent years. The studies reviewed for this paper examined the competencies of TLE and technical-vocational teachers (Basal, 2022; Villanueva, 2018), the readiness of TVL program implementers and the challenges they met (Adanza & Sayson, 2022), the development of teachers' technical skills (Calanog, 2021), the learning environment and learner employability (Vallesteros, 2022), and the teaching strategies of TVL teachers (Abdul & Silor, 2024). Most of these studies describe competency levels, readiness, or the strategies teachers use. Abdul and Silor (2024), for example, examined TVL teachers' strategies as a basis for pedagogical training design. In the studies reviewed here, however, it is rarely specified, for a single school and its particular specializations, how teacher-reported strategies and classroom challenges translate into the content, delivery, implementation arrangements, and evaluation of a training program. This is the gap the present study addresses.

The study makes three contributions. First, it documents, in the teachers' own accounts, the techniques and strategies used in TLE classrooms at one rural public secondary school. Second, it documents the challenges the teachers described. Third, it uses an explicit theme-to-component process to propose a school-based

pedagogical training framework that can later be validated and piloted. The contribution to TLE pedagogy is therefore a context-specific account of practice and a testable training design anchored in teacher-reported needs; the study does not make claims about TLE teaching across the Philippines.

Lamo National High School (LNHS) in Barangay Lamo, Dupax del Norte, Nueva Vizcaya, began as Lamo Barangay High School and was converted into a national high school in 1983 (Republic of the Philippines, 1983). It offers junior and senior high school programs, and its learners come largely from rural, farming, and working-class families whose livelihoods are grounded in agriculture and small-scale enterprises. For these learners, TLE is a practical pathway to self-reliance and employability. The school offers TLE specializations that align with the local community's socio-economic profile, such as food processing, crop production, and beauty care. This study focused on the Industrial Education and Home Economics teachers.

Because TLE specializations involve different practical areas, how teachers plan and deliver lessons is expected to vary. To the researcher's knowledge, there was no documented, teacher-sourced account of these practices at LNHS to guide school-based professional development. This study therefore explored the techniques and strategies TLE teachers at LNHS employed and the challenges they described, and used these findings to propose a context-specific training framework.

Research Questions

The study explored the instructional strategies and techniques employed by TLE teachers and the challenges they described, and used these findings as the basis for a pedagogical training framework.

The research specifically sought to answer the following:

1. What instructional techniques and strategies do TLE teachers employ in delivering specialized subjects?
2. What challenges do TLE teachers describe in teaching specialized subjects, including the classroom situations in which these challenges arise?
3. How can the themes identified in Questions 1 and 2 be translated into a pedagogical training framework for TLE teachers at LNHS?

In this study, "experiences" in Question 2 refers to the teachers' descriptions of the classroom situations in which challenges arose; it was not analyzed as a separate phenomenon. Question 3 is addressed through the documented design process reported in the Results and Discussion, rather than through additional data collection. Terms are used consistently throughout: an instructional strategy is the overall plan a teacher uses to organize learning (for example, collaborative learning); an instructional technique is a specific classroom procedure used within a strategy (for example, a warm-up energizer); a method refers to an established procedure such as demonstration; and an approach refers to a broad orientation such as student-centered teaching.

LITERATURE REVIEW

TLE is part of the K–12 Basic Education Curriculum established under Republic Act No. 10533 (Republic of the Philippines, 2013) and is designed to equip students with practical competencies aligned with workforce requirements. It covers specializations such as industrial arts, computer system servicing, home economics, and beauty care. In senior high school, the Technical-Vocational-Livelihood (TVL) track prepares learners for employment and entrepreneurship. Technical and vocational education is likewise framed internationally as a means of equipping young people with skills for work and for sustainable development (UNESCO, 2016). Teaching in this field is demanding because teachers must select and adapt instructional strategies that suit both the content and learners' circumstances. Abdul and Silor (2024) found that TVL teachers commonly relied on

lectures, demonstrations, oral questioning, and discussion, and adapted them to resource availability, teaching experience, and financial constraints.

TLE instruction combines theoretical lessons with laboratory or workshop-based practice, so teachers plan both and choose among demonstrations, practical exercises, collaborative work, and problem-based tasks. A range of methods has been identified as suitable, including demonstration, imitation, mastery learning, situational teaching, scaffolding, and collaborative learning (Wei & Wo, 2006). Zhang and Zheng (2016) describe the teaching process as an interplay of teachers, students, and content, and contrast teacher-led approaches with learner-centered approaches that promote interaction and experiential learning. These ideas rest on established learning theory: Vygotsky (1978) described learning as socially mediated, and Kolb (1984) described it as a cycle of concrete experience, reflection, conceptualization, and experimentation, which fits hands-on TLE tasks. Cooperative learning is more than seating learners in groups; it depends on positive interdependence and individual accountability (Johnson & Johnson, 2009). In cookery, Rinonos (2023) documented that many TLE teachers continued to rely on traditional teaching methods, while food-innovation strategies were reported to have positively shaped learners' skills. Whether teaching styles should be matched to learners' preferences is itself contested (Wong, 2015), which is a reason to examine what teachers actually do in their own settings.

Technology integration is a pedagogical design problem and not only a matter of access. Mishra and Koehler (2006) argued that effective teaching with technology depends on the interplay of technological, pedagogical, and content knowledge. In the Philippine setting, limited access to ICT has been reported as a barrier in developing TLE teachers' technical skills (Calanog, 2021), and Adanza and Sayson (2022) identified institutional gaps in the readiness of TVL program implementers, alongside the dedication of educators and administrators in bridging them. Teachers' use of ICT should therefore be interpreted against the resources actually available in the school.

Basal (2022) identified challenges encountered by TLE teachers, including curricular revisions, technology integration, changes in learner behavior, and the need for differentiated instruction. Beyond these, three concerns are especially relevant to practical subjects. First, research on classroom management indicates that clear rules and procedures and positive teacher–student relationships are central to orderly classrooms (Marzano et al., 2003). Second, time is a resource: Carroll's (1963) model of school learning holds that learning depends on the time allowed relative to the time a learner needs, which makes pacing a practical concern in lessons that combine theory and hands-on work. Third, learners' welfare in workshops and laboratories depends on safe learning environments, which the Philippine Professional Standards for Teachers (PPST) treat as part of the Learning Environment domain (DepEd, 2017).

Addressing instructional challenges calls for continuous feedback and evidence. Black and Wiliam (1998) reviewed evidence that formative assessment can raise achievement, and Hattie and Timperley (2007) showed that the effect of feedback depends on its type and on how it is delivered. Philippine classroom assessment policy likewise emphasizes formative assessment (DepEd, 2015). For training design, these ideas support feedback loops, targeted teacher support systems, and quality assurance procedures that allow misconceptions to be corrected early.

Given these challenges, educators have consistently highlighted the need for enhanced capacity-building initiatives from DepEd. Soriano and Vargas (2021) underscore the demand for responsive and practical training programs that strengthen teachers' competence. Villanueva (2018), studying technical-vocational teachers in a college of education, reported that many met or exceeded competency benchmarks set by the Technical Education and Skills Development Authority (TESDA). Research on professional development indicates that programs are more likely to be effective when they are content-focused, involve active learning, fit teachers' context, last long enough, and involve collective participation (Desimone, 2009). Darling-Hammond et al. (2017) similarly identified content focus, active learning, collaboration, modeling, coaching, feedback and reflection, and sustained duration as features of effective programs. Guskey (2002) added that teachers tend to change their practice after they see evidence of improved student learning, which argues for building evaluation into training design. In Philippine public schools, school-based professional development is commonly organized through Learning Action Cells (DepEd, 2016a).

Taken together, the literature shows that TVL and TLE teachers use a mix of conventional and learner-centered strategies shaped by resources and experience (Abdul & Silor, 2024; Rinonos, 2023); that reported challenges cluster around technology, learner behavior, and resources (Basal, 2022; Calanog, 2021); and that training is more likely to be effective when it is content-focused, active, sustained, and evaluated (Darling-Hammond et al., 2017; Desimone, 2009; Guskey, 2002). What is less developed in the studies reviewed here is the explicit link from teacher-reported practice and challenges to training components. Three ideas therefore anchor this study. Constructivist and experiential learning (Kolb, 1984; Vygotsky, 1978) frame the interpretation of collaborative and hands-on strategies. Technological pedagogical content knowledge (Mishra & Koehler, 2006) and pedagogical content knowledge (Shulman, 1987) frame the interpretation of ICT integration and lesson preparation. The features of effective professional development (Darling-Hammond et al., 2017; Desimone, 2009) frame the design of the training framework's delivery and evaluation.

RESEARCH METHODOLOGY

a. Research Design

The study used a qualitative descriptive design (Kim et al., 2017; Sandelowski, 2000). Qualitative research collects non-numerical data to understand how people experience and respond to situations, and it is well suited to questions about meaning and context (Cleland, 2017). A qualitative descriptive design was chosen because the aim was to describe, in everyday terms close to the teachers' own accounts, what TLE teachers do and what challenges they face, as a practical basis for training design, and not to build a theory or to explore a lived-experience phenomenon in depth. Open and axial coding originate in grounded theory (Corbin & Strauss, 2015; Strauss & Corbin, 1998). In this study they were used as coding procedures within an inductive qualitative descriptive analysis; no theory-building was attempted.

Researcher role and reflexivity. The researcher is a Head Teacher at the study school and, as part of that role, supervises teachers and observes their implementation of the curriculum. This position gave access and a close understanding of the school and of TLE instruction. It also placed the researcher in a supervisory relationship with the participants, which may have shaped what they were willing to say (for example, through social desirability) and how the researcher interpreted their accounts. The researcher's routine observations were part of regular instructional supervision; they were not collected as research data and were not coded, and the themes were derived from the interview transcripts. The measures taken to reduce these influences are described under Ethical Considerations, and the remaining limitation is stated under Limitations.

b. Participants and Sampling Procedure

The study employed purposive sampling (Palinkas et al., 2015), a non-probability technique that allows the researcher to deliberately select participants based on characteristics relevant to the research objectives. The respondents were chosen because they were tenured TLE teachers at Lamo National High School who specialize in Industrial Education or Home Economics, and they therefore possessed firsthand knowledge of classroom-based instructional strategies and techniques in the TLE learning environment.

Seven teachers participated. All were tenured TLE teachers at Lamo National High School whose specialization is Industrial Education or Home Economics. The inclusion criteria were: (a) a permanent (tenured) appointment at LNHS, (b) a specialization in Industrial Education or Home Economics, and (c) current teaching of TLE specialized subjects. Teachers who were not tenured, or whose specialization was in other TLE areas, were not included. Teachers were invited in writing and agreed voluntarily. Table 1 presents the participant profile. To protect identity in a small school, characteristics are reported by participant code (P1–P7), and ranges are used where a single value could identify a teacher.

Sample size was judged on information power rather than on numbers alone (Malterud et al., 2016): the aim was narrow (to describe practices and challenges in TLE instruction), the participants were specific to the topic, and the interview guide was focused, so a small sample could supply sufficient information for a descriptive study. The analysis also considered whether later interviews were still producing new codes (Guest et al., 2006). The sample is nonetheless small and confined to one school, so the findings are not generalizable and are offered for transferability only.

c. Instrument

A structured interview guide was the primary instrument. It was designed to capture the instructional techniques and strategies employed by TLE teachers and the challenges they experienced in delivering specialized subjects, and it responded directly to Research Questions 1 and 2 (Table 2). A structured format was chosen so that all seven teachers were asked the same core questions, which allowed responses to be compared across participants and TLE specializations and kept interviews within the limited time teachers could spare. The trade-off is that a structured format may limit emergent topics, which the exploratory aim of the study would otherwise favor; this is acknowledged under Limitations.

Table 1. Profile of the participants

Code	Specialization	Years of teaching	Highest educational attainment	TLE subjects currently taught
P1	Industrial Education or Home Economics	11	Bachelor's Degree	Specialized TLE
P2	Industrial Education or Home Economics	5	Bachelor's Degree	Specialized TLE
P3	Industrial Education or Home Economics	9	Bachelor's Degree	Specialized TLE
P4	Industrial Education or Home Economics	17	Bachelor's Degree	Specialized TLE
P5	Industrial Education or Home Economics	21	Master's Degree	Specialized TLE
P6	Industrial Education or Home Economics	15	Bachelor's Degree	Specialized TLE
P7	Industrial Education or Home Economics	3	Bachelor's Degree	Specialized TLE

Table 2. *Alignment of the interview guide with the research questions*

Part	Research question	Focus
A	RQ1	Instructional techniques and strategies used in delivering specialized subjects
B	RQ2	Challenges encountered in teaching specialized subjects and the classroom situations in which they arose

Validation. The guide was validated before use by a panel of experts in TLE and education, who rated each item for clarity, relevance, and alignment with the research questions; items were revised according to their comments. The validators were three school principals who specialize in TLE.

d. Data Gathering Procedure

The data were gathered in the following steps. Prior to the conduct of interviews, the researcher obtained formal approval from the School Head, through the Head Teachers and the Revitalized Team STAR. This ensured transparency and adherence to school protocols. Once approval was secured, request letters and informed consent forms were distributed to the TLE teachers who served as respondents, with emphasis on voluntary participation and confidentiality. Interviews were conducted individually and face-to-face in a quiet room at the school, at a time agreed with each teacher and outside their teaching load. They were conducted in the language the participant preferred (English, Filipino, or both), audio-recorded with the participant's consent, and transcribed verbatim by the researcher. Transcripts were checked against the recordings, and the same guide was used for all seven interviews to keep them consistent and complete. Recordings, transcripts, and consent forms were stored as described under Ethical Considerations.

e. Data Analysis

The analysis was inductive and followed the steps below:

1. **Familiarization.** The researcher read each transcript repeatedly and noted initial impressions.

2. **Open coding.** Meaningful segments of each transcript were labeled with short descriptive codes (for example, "group activities," "QR codes," "noise from construction"), staying close to the teachers' words.

3. **Axial coding.** Related codes were compared and grouped into categories, and relationships among categories were examined across participants (Corbin & Strauss, 2015).

4. **Theme development.** Categories were consolidated into themes that answered Research Questions 1 and 2, and each theme was checked against the coded excerpts and the full transcripts.

5. **Review and interpretation.** The themes were reviewed for overlap and for fit with the data, then interpreted against the literature. Findings were reported with verbatim excerpts labeled by participant code (P1–P7), and Tables 4 and 5 show the path from excerpt to code to category to theme.

6. **Translation into training components.** The themes were then mapped to training areas and components through the design process described under Research Question 3.

Trustworthiness was addressed using the criteria of Lincoln and Guba (1985), as applied to thematic analysis by Nowell et al. (2017). Only procedures that were actually carried out are reported in Table 3; procedures that were not carried out are acknowledged as limitations.

Table 3. *Trustworthiness procedures*

Criterion	Procedure	Carried out in this study
Credibility	Member checking of transcripts or summaries by participants	Transcript summaries were returned to participants to confirm accuracy.
Credibility	Peer debriefing or review of codes by a colleague or adviser	Codes and themes were reviewed by a colleague or adviser.
Dependability	Audit trail: coded transcripts, codebook, and decisions kept	Coded transcripts, the codebook, and analytic decisions were kept as an audit trail.
Confirmability	Reflexive notes on researcher position and assumptions	Reflexive notes were kept on the researcher's supervisory role and assumptions, and themes were checked against excerpts.
Transferability	Description of the school, participants (Table 1), and context so readers can judge fit	Yes. See Introduction and Table 1.

f. Ethical Considerations

The study was conducted in a responsible and respectful manner. All participants were informed about the purpose and objectives of the research, and a written consent form was provided and explained to every respondent. Participation was voluntary, and participants could withdraw at any point without negative consequences.

Voluntariness in a single-school setting. Because the researcher is a Head Teacher who supervises and observes the participants, there was a risk that teachers might feel pressure to take part or to answer in ways they thought favorable. To reduce this risk, invitations were written and could be declined without giving a reason; participants were told that taking part or not, and their answers, would not affect their performance ratings, supervision, or classroom observation results; and individual responses were not shared with the School Head or other colleagues.

Privacy and data protection. Names and personal details were not revealed; participant codes (P1–P7) were used, and excerpts that could identify a teacher were generalized. Data handling was guided by the Data Privacy Act of 2012 (Republic of the Philippines, 2012). Recordings and transcripts were kept in password-protected files accessible only to the researcher and will be permanently deleted [3] years after publication.

Ethics review and consent. [Author to complete: name the body that reviewed or approved the study (for example, the institution's ethics review committee or the Schools Division Office) and give the approval date or reference number. If formal ethics review was not required or obtained, state this and explain which approvals were secured.] The written consent form should be described as covering the purpose of the study, voluntary participation, audio recording, the use of anonymized excerpts in publication, and the right to withdraw [state the last point at which withdrawal was allowed].

Data retention and translation. [Author to confirm: replace "[3] years" above with the actual retention period, state who may access the files and how they will be destroyed, and state who translated excerpts given in Filipino and how the translations were checked.]

The researcher ensured that no physical, emotional, or social risk befell the teachers who participated, and findings were reported truthfully, without fabrication, alteration, or misrepresentation. The paper was also checked for originality, but this is a matter of research integrity and is separate from the ethical protections above.

Author's Verification Note: The representative excerpts currently entered in Tables 4 and 5 are illustrative drafting examples generated for layout purposes. They are not verified verbatim interview data and must be checked against the original transcripts and corrected or replaced before submission or publication. The provisional participant codes are illustrative only and must be matched to the actual source transcripts.

RESULTS AND DISCUSSION

The findings are presented by research question. All findings are based on what the seven teachers said in their interviews, which were the only data analyzed. The researcher's routine supervisory observations were not analyzed as data. Statements such as "teachers reported" therefore describe self-reported practice, and the study makes no claim about how well any practice worked or about learner outcomes. Tables 4 and 5 show the audit trail from excerpts to codes, categories, and themes.

Research Question 1: Instructional techniques and strategies

Table 4. *Coding matrix for Research Question 1: Instructional techniques and strategies employed by TLE teachers*

Theme	Categories and codes	Representative excerpt (participant code)	Participants contributing
1. Collaborative and student-centered learning	Group activities; hands-on demonstrations; warm-up energizers; positive reinforcement for participation	*"I usually let my students work in groups, especially when the activity requires them to share ideas and skills. Through group activities, they can help one another, and those who understand the lesson better can guide their classmates."*	P1
2. ICT integration and interactive instruction	Use of ICT tools; QR codes; presentations to facilitate learning	*"I use videos and other available technology to make the lesson easier to understand. Sometimes, I show them the actual procedure first before allowing them to perform the activity. It helps them see how the task should be done."*	P4

3. Instructional preparedness	Well-prepared instructional materials; clear instructions; demonstration of tools	"*Before I start the lesson, I make sure that the materials and tools are ready. In TLE, preparation is very important because the students need to see the process and follow the correct steps, especially during practical activities.*"	P6

Theme 1: Collaborative and student-centered learning. Teachers reported using group activities, hands-on demonstrations, warm-up energizers, and positive reinforcement for participation. These practices are consistent with socially mediated and experiential accounts of learning (Kolb, 1984; Vygotsky, 1978) and with the demonstrations and discussion that Abdul and Silor (2024) reported among TVL teachers. The excerpts alone do not show whether the group tasks were structured around individual accountability, which cooperative learning depends on (Johnson & Johnson, 2009). That is a question the training should address, not one this study can answer.

Theme 2: ICT integration and interactive instruction. Teachers described using ICT tools, QR codes, and presentations to make lessons more interactive, and they described this use as varying from lesson to lesson. Read through the TPACK framework (Mishra & Koehler, 2006), the range from presentations to QR-code resources suggests that ICT use differs in how far it supports interaction and not only in how often it is used. Reported limits on ICT access (Calanog, 2021) mean that training should include low-bandwidth and offline options.

Theme 3: Instructional preparedness. Teachers reported preparing instructional materials in advance, giving clear instructions, and demonstrating tools before practical work. Teachers tied preparation to smoother lessons; this is their perception and was not measured. Lesson preparation is also a policy expectation in DepEd's guidelines on daily lesson preparation (DepEd, 2016b) and a component of the pedagogical content knowledge that teachers draw on in planning (Shulman, 1987).

Research Question 2: Challenges in teaching specialized subjects

Table 5. *Coding matrix for Research Question 2: Challenges described by TLE teachers*

Theme	Categories and codes	Representative excerpt (participant code)	Participants contributing
4. Classroom management and environmental challenges	Noisy students; inattentive learners; disruptions from external noise (for example, construction)	*"One of the challenges I encounter is when some learners become noisy and lose their focus during the discussion. Sometimes, the noise coming from outside the classroom also affects their concentration. I have to remind them of the classroom rules and bring their attention back to the lesson."*	P2
5. Time management	Lessons extending beyond the allotted time	*"There are times when the activity takes longer than the time allotted, especially when some students need more guidance. I have to adjust my pacing so that they can finish the activity and still understand the important steps of the lesson."*	P7
6. Safety and learner welfare concerns	Attention to safety precautions during practical activities; need for consistent monitoring	*"During practical activities, I always remind the students to observe safety precautions and use the tools properly. I also need to monitor them while they are working because they may get distracted or forget the correct procedure if they are not guided."*	P3

Theme 4: Classroom management and environmental challenges. Teachers described noisy and inattentive learners and disruptions from outside the classroom, such as nearby construction. Classroom management research points to clear rules and procedures and positive teacher–student relationships as central to orderly classrooms (Marzano et al., 2003), so part of this challenge is addressable through teacher training. External noise, however, is an environmental condition that teachers cannot fully control, so the framework pairs teacher-level strategies with school-level action, such as scheduling noisy activities and using different spaces.

Theme 5: Time management. Teachers reported that lessons sometimes extended beyond the allotted time. Carroll's (1963) model of school learning, in which learning depends on time allowed relative to time needed, suggests why pacing matters in subjects that combine explanation with hands-on practice. Realistic time allocation during lesson planning is therefore treated as a training component.

Theme 6: Safety and learner welfare concerns. Teachers described attention to safety precautions during practical activities and the need to monitor safety consistently. This theme reflects teachers' concern for learners' welfare in workshops and laboratories and is not, on the evidence of the interviews, a report that safety incidents occurred. The PPST places safe and secure learning environments within its Learning Environment domain (DepEd, 2017), which supports including safety and risk management as a distinct training area.

Research Question 3: Development of the proposed pedagogical training framework

How the framework was developed. The framework was built in six documented steps. (1) The six themes were consolidated into five training areas; instructional preparedness and time management were combined because both concern planning and pacing a lesson. (2) For each area, the competency focus was aligned with the relevant domain of the PPST (DepEd, 2017). (3) Delivery strategies were chosen to reflect features of effective professional development: content focus, active learning, collaboration, coaching and feedback, and sustained duration (Darling-Hammond et al., 2017; Desimone, 2009). (4) Implementation arrangements were set within existing DepEd school structures, notably Learning Action Cells (DepEd, 2016a). (5) Evaluation indicators were specified at four levels (Kirkpatrick & Kirkpatrick, 2006), consistent with Guskey's (2002) point that training should be evaluated by its effect on practice and learning. (6) Expert validation and a pilot were identified as the next step; neither has been done. The framework is therefore a proposal grounded in teacher accounts and the literature, not a tested program.

Framework overview. Figure 1 shows how the evidence base (the six themes) feeds five training modules, which are delivered through school-based strategies and evaluated at four levels, with evaluation results feeding back into revision of the modules. Table 6 links each theme to its training area and PPST domain.

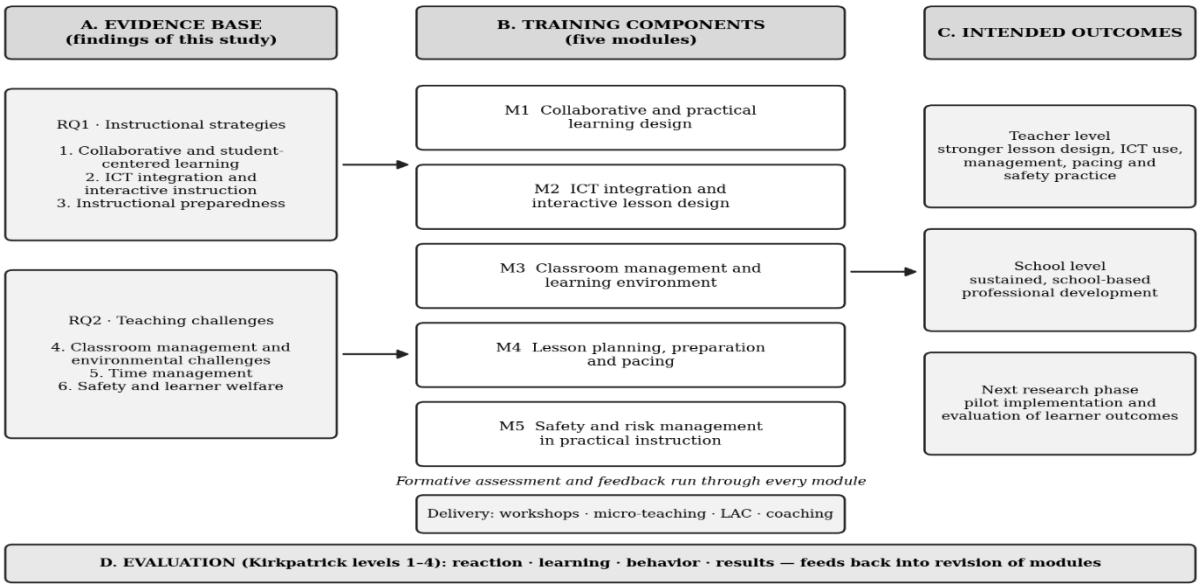

Figure 1. *Proposed pedagogical training framework for TLE teachers at LNHS*

Table 6. *Linkage of findings to training areas*

Theme (source)	Teacher-reported evidence	Training module	PPST domain (DepEd, 2017)
1. Collaborative and student-centered learning (RQ1)	Group activities; hands-on demonstrations; energizers; positive reinforcement	M1. Collaborative and practical learning design	Content Knowledge and Pedagogy
2. ICT integration and interactive instruction (RQ1)	ICT tools; QR codes; presentations; variable use	M2. ICT integration and interactive lesson design	Content Knowledge and Pedagogy (use of ICT)
4. Classroom management and environmental challenges (RQ2)	Noisy or inattentive learners; external noise	M3. Classroom management and learning environment	Learning Environment
3. Instructional preparedness (RQ1) and 5. Time management (RQ2)	Prepared materials and clear instructions; lessons running over time	M4. Lesson planning, preparation, and pacing	Curriculum and Planning
6. Safety and learner welfare concerns (RQ2)	Safety precautions in practical work; need for consistent monitoring	M5. Safety and risk management in practical instruction	Learning Environment

Goal and objectives. The goal of the framework is to strengthen the instructional practice of TLE teachers at LNHS in the five areas teachers identified. By the end of the training, participating teachers are expected to be able to do what is stated in Table 7. Each module is specified with its objectives, content, delivery, and indicators.

Table 7. *Training modules: objectives, content, delivery, and indicators*

Module	Objectives (teachers will be able to…)	Content and competency areas	Delivery strategies	Indicators of attainment
M1. Collaborative and practical learning design	Design group tasks with defined roles and individual accountability; plan demonstration, guided practice, and independent practice; use motivational strategies	Cooperative learning structures; group roles and rubrics; sequencing practical lessons; positive reinforcement; keeping group work productive	Modeled demonstrations; workshop; micro-teaching; peer observation	Lesson plan with a structured group task, roles, and rubric; micro-teaching rubric rating
M2. ICT integration and interactive lesson design	Select ICT tools that fit lesson objectives, including offline options; build interactive lesson segments; judge ICT use with TPACK questions	TPACK; creating QR-code resources and simple digital materials; interactive presentation design; curating digital resources; plans for limited connectivity	Hands-on computer-laboratory sessions; lesson-design clinic; sharing of outputs in LAC	ICT-supported interactive lesson plan per teacher; peer-rated interactivity checklist

M3. Classroom management and learning environment	Set routines and rules; use attention and re-engagement techniques; arrange workshop space; plan around external noise	Rules and procedures; transitions; grouping; layout of laboratories and kitchens; scheduling around noise	Case analysis of teachers' own classrooms; role-play; coaching; school-level problem solving with the School Head	Written classroom-routine plan; observation checklist of instructional time lost to disruptions
M4. Lesson planning, preparation, and pacing	Prepare daily lesson plans with realistic time allocations for theory and practice; prepare materials and tool kits ahead; use pacing checks	Components of daily lesson preparation (DepEd, 2016b); time budgeting; pre-lesson checklist; contingency for overruns	Planning workshop; co-development of a template; peer review of lesson plans	Lesson plans with timed segments; teacher time log of lessons completed within the allotted time
M5. Safety and risk management in practical instruction	Identify hazards in own specialization; give safety briefings before practical work; supervise; respond to and document incidents	Hazard identification and risk assessment per specialization; protective equipment; tool handling; supervision; first-aid referral; incident documentation	Practical workshop in actual laboratories; resource persons (for example, school nurse, DRRM coordinator); walk-through audits	Hazard checklist completed for each laboratory; safety briefing included in all practical lesson plans
Cross-cutting: formative assessment and feedback	Embed checks for understanding and rubric-based feedback in each module	Formative assessment (Black & Wiliam, 1998); effective feedback (Hattie & Timperley, 2007); classroom assessment policy (DepEd, 2015)	Built into every module session; reflection journals	Feedback and checks for understanding present in lesson plans and observed lessons

Implementation arrangements. The framework is intended for all TLE teachers at LNHS, not only the seven participants. It runs over one school year so that training is sustained and not a one-off event (Desimone, 2009). The timing and durations in Table 8 are indicative and should be finalized after expert validation.

Table 8. *Implementation plan*

Phase	Activities	Responsible implementers	Indicative timing	Resources
1. Orientation and baseline	Orientation to the framework; teacher self-assessment against the five areas; setting priorities among modules	School Head (approval and resources); TLE Head Teacher (coordinator)	Before or at the start of the school year, such as during in-service training	Training room; self-assessment form

2. Core module sessions	Delivery of M1–M5 through workshops, followed by LAC sessions to share outputs	TLE Head Teacher and LAC facilitators; resource persons: ICT coordinator, school nurse, DRRM coordinator, division TLE Education Program Supervisor, TESDA-accredited trainers where available	Spread across the school year, one module at a time	ICT equipment; laboratories; protective equipment; printing; school funds for LAC
3. Classroom application and coaching	Teachers apply module outputs in lessons; peer observation and coaching, at least one cycle per module	TLE Head Teacher; master teachers; peer coaches	Within two to three weeks after each module	Observation checklists; release time as feasible
4. Review and reflection	LAC review of evaluation data; revision of modules; report to the School Head	School Head; TLE Head Teacher; LAC facilitators	End of the school year	Evaluation summaries

Evaluation mechanisms. The framework is evaluated at the four Kirkpatrick levels (Kirkpatrick & Kirkpatrick, 2006), summarized in Table 9. Targets are indicative and should be set with the validation panel. Level 4 results, such as learner engagement and learning outcomes, are not measured in this study and belong to the pilot phase.

Table 9. *Evaluation matrix*

Level	Key question	Indicators and instruments	Timing
1. Reaction	Did teachers find the sessions relevant and usable?	End-of-session feedback form (relevance, clarity, usefulness)	After each module
2. Learning	Did teachers gain the intended competencies?	Pre/post self-assessment; micro-teaching rubric; quality of module outputs (for example, lesson plans, hazard checklists)	Before the program and after each module
3. Behavior	Did teachers change classroom practice?	Lesson-plan review checklist; coaching and peer-observation checklist; teacher time log	Phase 3 and end of year
4. Results	Did practice changes relate to learner engagement and outcomes?	Learner engagement indicators and learning outcomes (to be defined in a pilot study)	Pilot phase, after implementation

Validation and next phase. Before pilot implementation, the framework should undergo content validation by a panel of experts, such as TLE education program supervisors, master teachers, and teacher educators, using a structured rating form. The validated framework should then be piloted at LNHS and evaluated using Table 9, and revised accordingly.

LIMITATIONS

The findings of this study should be read with the following limitations in mind. First, the data are self-reports from seven tenured teachers in one rural public school, so the findings describe what these teachers said, cannot be generalized, and are offered for transferability only. Second, only Industrial Education and Home Economics teachers took part; other TLE specializations offered at the school, such as those in food processing, crop production, and beauty care, were not represented.

Third, the researcher is a Head Teacher who supervises the participants. Despite the safeguards described under Ethical Considerations, this relationship may have led teachers to give socially desirable answers and may have influenced how the accounts were interpreted. Fourth, a structured interview guide was used so that all teachers answered the same core questions within limited time; this kept interviews consistent but may have restricted emergent topics. Fifth, the researcher's routine supervisory observations were not analyzed, so teachers' accounts were not checked against observed classroom practice, learner perspectives, or learning outcomes.

Finally, the proposed training framework is a design grounded in teacher accounts and the literature. It has not been validated by experts or piloted, and its feasibility, acceptability, and effects remain untested.

CONCLUSION

Based on the findings of the study, the following conclusions are drawn:

1. The seven TLE teachers reported using group activities, hands-on demonstrations, warm-up energizers, positive reinforcement, ICT-assisted lessons, and advance preparation of materials. They described ICT use as varying across lessons.

2. The teachers described challenges with noisy or inattentive learners and external noise, lessons that ran beyond the allotted time, and the need to monitor safety consistently during practical activities.

3. These accounts, read against the literature, point to five areas for teacher training: collaborative and practical learning design, ICT integration, classroom management, lesson planning and pacing, and safety and risk management. A framework for this training was proposed (Figure 1 and Tables 6–9).

Because the data are self-reports from seven teachers in one school, these conclusions describe what teachers said and do not establish the effectiveness of any practice or of the proposed training.

RECOMMENDATIONS

Based on the findings and conclusions, the following recommendations are made. Because the study did not rank teachers' needs, the priority order of modules should be set through the Phase 1 self-assessment and not assumed.

1. **TLE teachers.** TLE teachers should enhance student-centered learning through structured group activities, hands-on demonstrations, and practical exercises. They should integrate appropriate digital tools and offline resources while improving classroom management, lesson planning, time allocation, and safety practices.

2. **School administrators.** School administrators should provide adequate instructional materials, suitable learning environments, and sustained professional development through Learning Action Cells.

3. **Proposed training framework.** The proposed training framework requires expert validation and pilot implementation before adoption.

4. **Future researchers.** Future research should incorporate classroom observations, learner perspectives, and participants from additional schools to strengthen findings and assess transferability.

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